



**U.S. Army Research Institute  
for the Behavioral and Social Sciences**

**Research Report 1930**

**Methods and Measures for Communicating Tactics,  
Techniques, and Procedures**

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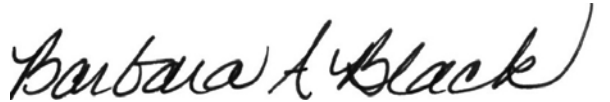
**September 2010**

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Research accomplished under contract  
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## REPORT DOCUMENTATION PAGE

1. REPORT DATE (dd-mm-yy) September 2010	2. REPORT TYPE Final	3. DATES COVERED (from. . . to) April 2009 – December 2009			
4. TITLE AND SUBTITLE Methods and Measures for Communicating Tactics, Techniques, and Procedures		5a. CONTRACT OR GRANT NUMBER W74V8H-04-D-0045 DO 0040			
		5b. PROGRAM ELEMENT NUMBER 633007			
6. AUTHOR(S) Heather Anderson, and Richard Topolski (Augusta State University); Bruce C. Leibrecht, and Chris Green (Northrop Grumman Technical Services); Brian T. Crabb and Carl Lickteig (U.S. Army Research Institute for the Behavioral and Social Sciences).		5c. PROJECT NUMBER A792			
		5d. TASK NUMBER 356			
		5e. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Northrop Grumman Technical Services Fort Knox, KY 40121 Augusta State University 2500 Walton Way Augusta, GA 30904 U.S. Army Research Institute for the Behavioral and Social Sciences 121 Morande Street ATTN: DAPE-ARI-IK Fort Knox, KY 40121-4141		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. Army Research Institute for the Behavioral and Social Sciences 2511 Jefferson Davis Highway ATTN: DAPE-ARI-IK Arlington, VA 22202-3926		10. MONITOR ACRONYM ARI			
		11. MONITOR REPORT NUMBER Research Report 1930			
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution is unlimited.					
13. SUPPLEMENTARY NOTES Contracting Officer's Representative and Subject Matter POC: Brian T. Crabb					
14. ABSTRACT: This report describes the methods developed and experiments executed to explore the best methods for communicating tactics, techniques, and procedures (TTPs) and measuring Soldiers' understanding of TTPs. It contains sample documentation of the communication methods, measures, training, and vignettes developed for this exploratory research and then packaged in a "TTP Toolbox" for Soldiers. Overall, each of the three modes of communication resulted in superior performance relative to the control condition, indicating the communication methods tested actually increased Soldiers' understanding of TTP. The Written mode of communication appeared to provide greater understanding of TTP; however, Soldiers preferred the Video-Graphic-Written mode. The authors examine alternate explanations for the findings and document lessons learned about TTP communication and measurement methods based on Soldiers' feedback. The report concludes with method recommendations to improve TTP communication and understanding for future research and implementation. A companion Research Product more fully documents the TTP methods in hard copy and electronic format to facilitate the transition of the TTP Toolbox to Army units and organizations.					
15. SUBJECT TERMS Tactics, Techniques, Procedures, Simulation-Based Vignettes, Future Force, Knowledge Assessment					
SECURITY CLASSIFICATION OF			19. LIMITATION OF ABSTRACT	20. NUMBER OF PAGES	21. RESPONSIBLE PERSON
16. REPORT Unclassified	17. ABSTRACT Unclassified	18. THIS PAGE Unclassified	Unlimited	64	Ellen Kinzer Technical Publication Specialist 703/602-8047



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**September 2010**

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**Army Project Number**  
633007A792

**Personnel Performance  
and Training**

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## ACKNOWLEDGMENTS

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We could not have conducted the research described in this report without the combined efforts of numerous people, in addition to the authors: the Soldiers at Fort Gordon, Fort Hood, and Fort Knox who willingly gave their time to participate in this project, Major Terrence Sommers, Executive Officer of the Augusta State University Reserve Officers' Training Corps (ROTC) program, and his Cadets.

The Northrop Grumman team members whose efforts were critical to this report include:

- Randi Duffee
- Frank Peak
- Bruce Haverty

# METHODS AND MEASURES FOR COMMUNICATING TACTICS, TECHNIQUES, AND PROCEDURES

## EXECUTIVE SUMMARY

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### Research Requirement:

As the Army continues to evolve, new operational requirements and procedures are introduced routinely. Units must be able to integrate new warfighting capabilities in materiel, organization, and doctrine, at a rapid pace. Essentially, any new operational requirement or forcing event require new tactics, techniques, and procedures (TTP) and/or tactical standing operating procedures (TSOP) to optimize a unit's effectiveness. Increasingly, the task of determining how to conduct a new operational requirement or employ new capabilities and integrate them with existing capabilities falls to Soldiers in the units. Previously, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) Research Unit at Fort Knox, KY, developed a "TTP Toolbox" for units to independently structure and guide their TTP development/revision activities while providing flexibility to respond rapidly to a wide range of operational requirements. Given the TTP Toolbox for TTP development and revision, there is now a need for research to improve TTP communication and assessment. This report describes exploratory research conducted to determine the best methods for communicating TTP to Soldiers and assessing their understanding.

### Procedure:

The research team presented three TTPs to 86 active-duty Soldiers using three incremental modes of communication --Written (W+); Graphic + Written (G+); and, Video + Graphic + Written (V+) -- to determine which was most effective for communicating TTP. Soldiers' understanding of TTP was assessed in terms of recall, recognition, and application with three assessment methods: a written Back Brief; a set of multiple-choice questions (referred to as "Traditional Questions"); and, a Video measure, in which incorrect actions presented in a video simulation were identified from a list. Soldiers in the control condition received identical binders as the Soldiers in the experimental condition, but with the communicate TTP materials removed. The research team used the assessment methods to measure the effectiveness of each mode of communication and gathered Soldiers' feedback on all communication and assessment methods during testing sessions.

### Findings:

Overall, each of the three modes of communication produced performance superior to the control condition, indicating the presentation methods developed in this experiment increased Soldiers' understanding of TTP. The Written mode of communication produced the best performance, although Soldiers preferred the V+ mode of communication. The report examines alternate explanations for the findings, including the exploratory nature of the methods and measures developed and tested. Lessons learned about various aspects of the research were documented for future research and development efforts.

## Utilization and Dissemination of Findings:

The exploratory findings include guidelines and recommendations for future research that is needed to improve TTP communication and assessment. A revised version of the TTP Toolbox now includes the communication methods and measures developed in this research, as well supporting training materials, vignettes, and trainer guides. The revised TTP Toolbox was provided to the Future Force Integration Directorate and the Army Evaluation Task Force for their efforts on force modernization. A companion Research Product documents the entire TTP Toolbox in hard copy and electronic format to facilitate its transition to Army units and organizations in the Current Force.



# METHODS AND MEASURES FOR COMMUNICATING TACTICS, TECHNIQUES, AND PROCEDURES

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# METHODS AND MEASURES FOR COMMUNICATING TACTICS, TECHNIQUES, AND PROCEDURES

## Introduction

As new operational requirements and technologies are integrated into the U.S. Army, Soldiers and units must determine how the new requirement or technology impacts their unit. The 21<sup>st</sup> century Soldier faces a theater that is in a constant state of flux. Insurgents are constantly adapting and adopting new methods. Soldiers in turn are constantly updating their tactics, techniques, and procedures (TTPs) and tactical standing operating procedures (TSOP). New technologies place an additional strain on Soldiers. Even if operator training is provided for technology insertions, for example, a lack of employment training reduces the likelihood that the unit will readily use or fully exploit the new technology in combat. If the unit does attempt to adapt to the new requirement or technology, the lack of proper guidance and tools for developing or revising TTPs/TSOPs reduces the unit's training effectiveness and combat effectiveness. The pace of change in operational requirements and available technology is accelerated by the uncertainties of irregular warfare and the responsive emergence of new equipment and tools in support of the Army's Rapid Fielding Initiative (RFI) and Army Brigade Combat Team Modernization. For these reasons, it is essential that units receive assistance in exploring, developing, revising, communicating, and assessing TTPs to respond better to the dynamic and unpredictable nature of irregular warfare.

Traditional methods of TTP development range from analysts and experts developing and presenting new concepts, to using large-scale simulation exercises in which groups of Soldiers "virtually" employ the capability, to user juries in which Soldiers provide feedback on the capability, as developed or promoted. These methods are often time consuming and have limited application. Thus, there is a need to investigate new methods and measures for developing and communicating TTPs that can be used by units; methods that provide structured activities to measure, assess, and guide the TTP development and communication process, yet are flexible enough to respond rapidly to a wide range of units, technologies, and operational requirements.

The need to communicate is underscored by the U.S. Army doctrine definition of battle command as "... the art and science of understanding, visualizing, describing, directing, leading, and assessing forces to impose the commander's will on a hostile, thinking, and adaptive enemy" (Department of Army [DA], 2003b). A critical step in the process of battle command is to convey (describe) the commander's internal vision (visualize) of the mission and concept of the operation to staff and subordinates to facilitate a shared understanding of mission and commander's intent. In particular, planning guidance conveys the essence of the commander's visualization. Effective planning guidance is an initial concept of operations that reflects how the commander sees the operation unfolding. It broadly describes when, where, and how the commander intends to employ the force to accomplish the mission within the higher commander's intent. Similarly, small unit commanders must ensure a shared understanding of their unit's operation including the fundamentals of operation summarized in TTPs.

Doctrine indicates what battle command *should* describe (e.g., commander's intent, commander's critical information requirements, and the concept of operation). However,

doctrine and training provide little guidance on *how* to describe. What are the best methods and tools for describing operational concepts and constructs, including TTP? Research is needed to identify and develop the best methods and tools for describing more macro constructs such as commander's visualization and more micro constructs such as TTPs.

In a previous research effort (Topolski, Leibrecht, Kiser, Kirkley, & Crabb, 2009), the ARI Research Unit at Fort Knox, KY developed a novel method to structure the TTP development process. Based on Shadrick, Lussier, and Hinkle's (2005) flexible method of cognitive task analysis (FLEX), the FLEX-TTP method is an iterative and vignette-driven approach that harnesses knowledge elicitation techniques with groups of military subject matter experts (SMEs). The method was refined and proved successful in developing TTP for new technologies. Follow-on research adapted and expanded the FLEX-TTP method to produce a low-overhead "TTP Toolbox" for use by Soldiers in tactical units (Topolski, et al., in preparation). The TTP Toolbox is suitable for turnkey, independent use by units to structure and guide their TTP development/revision activities while providing flexibility to respond rapidly to a wide range of situations.

A noted shortcoming in ARI's original version of the TTP Toolbox was that it did not directly address the need to communicate or "share" new TTPs. Once new TTPs are developed, at least two significant communication challenges remain. First, what is the best method(s) for a commander to communicate TTPs in a manner that is easily understood and properly implemented by Soldiers? This dilemma is similar to that of a commander attempting to describe his/her visualization and the concept of operation (DA, 2001). Second, how does a commander assess Soldiers' understanding of a TTP before carrying out a mission or beginning a training event? Methods and tools that allow commanders to effectively describe TTPs and assess their Soldiers' understanding of TTPs should significantly improve the chances of mission success, reduce the likelihood of casualties, and increase the efficiency and effectiveness of training and operation.

The Army is exploring better ways to communicate TTP more effectively and efficiently. One emerging method is mass collaboration via the internet, a relatively new trend in information dissemination where many people work together to produce knowledge (Fallis, 2008). Wikis are web sites that allow individuals with access to the Internet site to edit information organized in an encyclopedia-type format (Fallis, 2008). Despite concerns about the quality of information provided in Wikis, one of the more popular, Wikipedia, is in general empirically reliable and verifiable. Tech Pedia is a Wiki that covers the technology genre including "internet start-ups, web reviews, gadgets, Windows tricks, and blogging platforms." Following suit, the United States Army has recently established a Wiki on <http://www.army.mil/AKO/>.

The focus of the research reported here is to explore methods and measures for communicating and assessing Soldiers' understanding of TTP. This report describes the methods developed and experiments executed to determine the best ways of communicating TTP and measuring Soldiers' understanding of TTP. It contains sample documentation of the communication methods, measures, training, and vignettes developed for this exploratory research. The report concludes by documenting guidelines and recommendations for the future research needed to improve TTP communication and understanding.

## *Background*

Current forces are experiencing an unprecedented rate of change in operational requirements and in the introduction of new technologies that underscores the need for more effective and efficient methods to communicate TTPs and assess Soldiers' understanding of TTP. Efficient training technologies reduce manpower requirements and increase learning and productivity (Zipperer, Klein, Fitzgerald, Kinnison, & Graham, 2003). The aim of this research is to discover the most effective and efficient ways to convey TTP and assess Soldiers' understanding of TTP.

### *Methods of Communication*

Good communication is important to any well-functioning organization. Yet, for the U.S. Army, communication is even more critical because of the high stakes invested in individuals, organizations, and mission success. Failures in communication may risk Soldiers' and civilians' lives and jeopardize mission success. Therefore, investigation of the most effective and efficient methods of communication is a high-value target. A review of the literature on conveying instructional information identified some valuable methods relevant to communicating TTP.

- Instructions that emphasize the structure or function of a task are better than a simple listing of instructions (Smith & Goodman, 1984). In addition, a model of how to operate a system should provide information about how and why it works as well as the overall goal. Kieras & Bovair (1984) showed that providing such information increases understanding and performance.
- A Soldier's level of experience has an effect on how well the communicated information is learned (Dyer, Singh, & Clark, 2005; Klein, Calderwood, & MacGregor, 1989). Information should be formatted with the target audience in mind.
- Providing feedback about training material during training is beneficial (Williams, Ward, & Chapman, 2003).
- Training techniques that incorporate both correct and incorrect demonstrations are effective (Baldwin, 1992, Jentsch, Bowers, & Salas, 2001; Salas, et al., 2009).
- Instructors should leverage new technologies to improve instruction. The World Wide Web offers wide access to instructional resources such as hypermedia, networks of related text, graphics, audio and video (Wisher & Olson, 2003). Wikis, such as Army Knowledge Online, are an example of a method of dissemination that allows for vast distribution of information to recipients anywhere. These technologies assist in training and embedded learning. The anytime, anywhere access to training materials that these technologies provide allows Soldiers to train using their usual system controls in vehicles or at their tactical command post (TCAP) workstation (Campbell, Campbell, Grossman, Graves, & Flynn, 2006).

The research team strived to incorporate many of the communication methods identified into the materials developed for this research. For example, the TTP descriptions were written on a level that almost any Soldier could understand regardless of experience. Both correct and incorrect examples were developed for communicating TTPs. Overall, the materials were constructed in a manner that is readily adaptable to new technologies.

## *Modes of Communication*

Informative research on multiple and mixed modes for presenting to-be-learned material was reviewed in the areas of pedagogical and cognitive science literature. Three different, and partially mixed, modes of presenting information that is reviewed and applied in the research reported here are written, graphic, and video information.

### Written

When is simply reading instructions sufficient to understand instructional material? While technological advancement in training capabilities offers advantages such as more realistic training conditions, it also provides new challenges for the trainers and trainees in terms of learning the new technology (Wampler, Dyer, Livingston, Blackenbeckler, Centric, & Dlubac, 2006). A set of written instructions have the advantage of being accessible to nearly all Soldiers since reading is a common, fundamental skill.

Smith and Goodman (1984) found that written instructions are often organized in a linear sequence, which provides a good format for understanding. The U.S. Army widely employs a method of writing in which material is bullet formatted. The Army approach also encourages a Bottom Line Up Front (BLUF) organization in which the objective is stated at the beginning, kept concise, and relevant to the immediate concern. The Army generally operates using a concise, organized fashion of presenting information, as illustrated in field manuals, training, and doctrine publications. While BLUF and bullet formatted lists may efficiently communicate information, they may fail to effectively convey all aspects of information. Lists may be adequate to convey explicit or declarative knowledge regarding a task, but fail to convey the implicit or procedural knowledge to complete the task. For example, providing a list of instructions on how to assemble a weapon may not effectively empower a Soldier to successfully complete the task.

Although some concerns exist regarding the limitations of written BLUF and bullet formatted lists, the researchers created the written TTP used in the research reported here in accordance with the concise, organized Army approach of BLUF.

### Graphic

The use of graphics to augment written instructions is widespread in military training and communication. For example, graphic materials are routinely used to illustrate operational settings and task performance in the context of mission rehearsals (DA, 2003a). Research indicates that Soldiers' visualization in training is an important technique for mastering a skill (Zipperer et al., 2003). The Soldiers and subject matter experts (SMEs) interviewed in their research indicated that the use of graphics displaying accurate actions and road maps showing the proper sequence were helpful training tools.

Current U.S. Army instruction manuals frequently employ a communication format of text supplemented with graphics. Good examples of how the Army often mixes written information with supplemental graphics that provide a visual image of the task or procedure

being described are training manuals on ground-fighting techniques (Department of the Army [DA], 2002), grenade machine guns (DA, 2003), and motor transport operation (DA, 2009)

Research has shown that graphics may facilitate understanding by allowing participants to recognize the next logical step in a complex task (Larkin & Simon, 1987). In contrast, written text may require greater cognitive costs in searching for important information. The same information can be deduced from both text and diagrams, but the inference processes used to gather information from written text might require additional effort. Information implied in text is often made explicit in a diagram. At least for solving problems, a diagram can be superior to a text description because diagrams reduce the effort of searching for information. However, simply having a diagram available when solving a problem is not sufficient. “Good” diagrams should be created in a way that takes advantage of categorizing information to reduce search and recognition processes, leading to higher comprehension of the material.

How do graphics fare as a stand-alone method of instruction? Research by Stone and Glock (1981) revealed that presenting written instructions and illustrations together was superior to presenting either written text or illustrations alone. By measuring eye movements, the researchers determined that readers first looked at the illustration to get the gist of the information and then to the text, subsequently alternating between each to compare. The graphics aid in understanding by providing a framework to organize the instructional steps. Similarly, Moreno (2006) points out that individuals learn better from a combination of words and graphics than from words alone. Graphics are often insufficient when used alone, therefore the inclusion of written instructions may be beneficial for optimal performance. Thus, the researchers developed the graphics for the current research as supplements to the written material, not as stand-alone documents.

### Video

It is generally accepted that individuals learn by watching others perform a task (Bandura, 1986). Demonstration-based learning is the observation by a learner of another person performing a task for the purpose of training (Salas, et al., 2009). The Army currently utilizes training aids, devices, simulators, and simulations (TADSS) with video-based components to facilitate training. Lessons learned from military training research promote the use of multimedia instruction (Wampler et al., 2006). Using a variety of instructional media and techniques will result in training that is more thorough, and a higher level of proficiency than a single training method alone. Such findings mirror those from academia, where Mayer (2005) found that multiple forms of media presented together produce better performance than one medium alone. Aspects of multimedia such as spatial and temporal contiguity, coherence, and redundancy facilitate successful learning.

Jean, Erwin, and Wright (2009) report that the U.S. military is successfully replicating insurgents’ actions from surveillance video into video simulations to train troops. A team of experts constructs the video simulations within days of the event and distributes it via networks to inform Soldiers about current insurgent tactics and the location of Improvised Explosive Devices (IEDs) along travel routes. Troops use the videos to plot locations of known IEDs, practice routes, and identify behaviors of insurgents. Video reenactments are

also being utilized to help troops learn cultural differences in “mock” Afghan and Iraqi towns to reduce conflicts created by cultural misunderstandings (Wright, 2009). The videos present a level of cultural emersion that cannot be conveyed through other forms of media, such as written or graphic modes of communication.

Given the empirical evidence and current practice in support of video-based training, the research team chose video simulations as a mode of TTP communication for the current research. Videos for the research were created using Virtual Battlespace 2 (VBS2) software that is currently used extensively by the Army. The video simulations demonstrate how to conduct, and not conduct, each TTP.

### *Vignettes*

The current research employs vignettes in which the Soldier assumes the role of a squad leader to demonstrate TTP to Soldiers. This method is similar to that used in research on the Think Like a Commander (TLAC) training approach which aims to train Soldiers how to quickly evaluate a rapidly changing tactical situation (Shadrick, Crabb, Lussier, & Burke, 2007). The TLAC approach fosters adaptive thinking in which Soldiers are able to respond effectively to rapidly changing situations (Shadrick, Lussier, & Fultz, 2007). A TLAC vignette includes elements of the situation that a commander should consider in decision-making. These “indicators” represent important considerations for expert battlefield commanders.

Vignettes situate Soldiers in meaningful learning conditions that help focus Soldiers’ attention on identifying correct responses (e.g., course of action). Recognition-primed decisions (RPD) are decisions for which appropriate courses of action are decided based on recognition of vital information and prior knowledge (Klein, Calderwood, & MacGregor, 1989). The researchers utilized operationally relevant vignettes in the current research that required Soldiers to identify the vital information for carrying out their assigned TTP.

### *Methods of Assessment*

The U.S. Army’s current methods for assessment include mental rehearsals such as a Confirmation Brief or Back Brief (DA, 2003a). In a Confirmation Brief, a subordinate leader briefs their commander immediately after being given instructions, such as an Operations Order (OPORD) or Fragmentary Order (FRAGO), for the commander to ensure the subordinate leader understands the commander’s intent, tasks to be executed, and the purpose of the mission. The purpose of a Back Brief, also performed by subordinates to the commander, is for the commander to assess how the subordinate intends to accomplish their mission. Back Briefs often take place throughout preparation and allow commanders to identify problems early in subordinates’ planning process. The Back Brief assessment method used in the current research primarily required Soldiers to identify the TTP’s key actions, in order, to assess their understanding of the TTP.



## *TTP Development and Implementation Process*

The overall goal of the TTP research effort was to explore methods and measures for communicating TTP and to promote their transition in the TTP Toolbox to Army users. Figure 1 outlines the six stages of the TTP process addressed in the TTP Toolbox including TTP development, implementation, and communication.

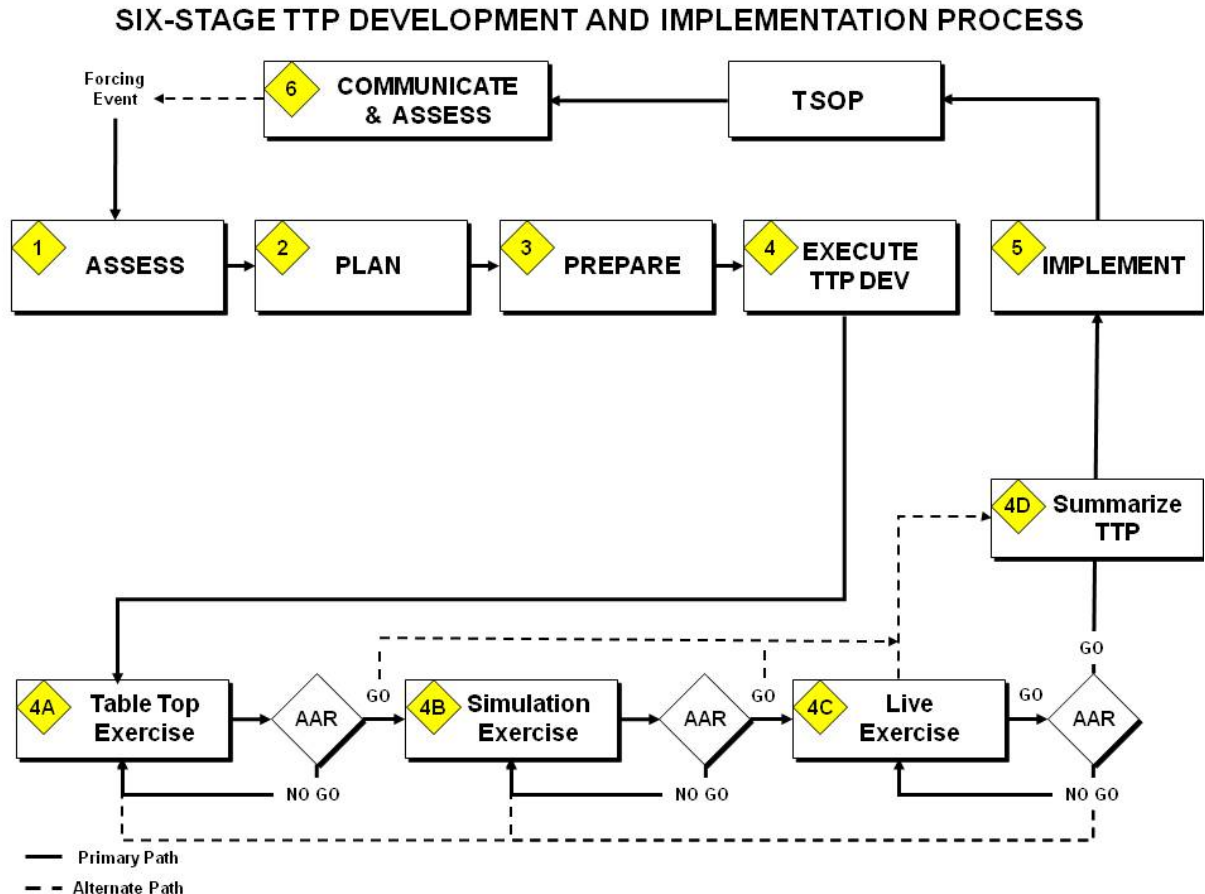


Figure 1. Six-Stage TTP development and implementation process.

The stages of the TTP process are as follows:

- **STAGE 1 – ASSESS:** The leader determines that his/her unit requires a new set of TTPs, or that the current set of TTPs is not adequate or current.
- **STAGE 2 – PLAN:** The leader has most of the responsibility to plan for the development/revision of TTP. He asks for or nominates a facilitator from his higher headquarters. The facilitator collaborates with and assists the leader.
- **STAGE 3 – PREPARE:** The leader develops an OPORD for the exercise. The OPORD must contain all the information participants will need to accomplish the MAPEX/table top, simulation, and live exercises of the development/revision process.
- **STAGE 4 – EXECUTE:** The leader provides the personnel and applies his guidance and tactical expertise, but the facilitator has most of the responsibility for the exercises during this stage of the process. He runs the exercises, serves as timekeeper, and

modifies the schedule depending on the outcomes of the map exercise (MAPEX)/table top, simulation, and live exercises.

- - Stage 4A – Table Top Exercise: Participants wargame the proposed TTP. At the conclusion of the exercise, the participants conduct an after action review (AAR) to determine if the TTP execution was a Go/No Go. If the outcome of the AAR is a Go, the leader may choose to bypass the simulation and/or live exercises and proceed to stage 4D; however, completion of all execution stages is recommended.
  - Stage 4B – Simulation Exercise: Participants complete a simulation exercise to further evaluate the TTP. The leader may choose to bypass the live exercise and proceed to stage 4D; however, completion of all execution stages is recommended.
  - Stage 4C – Live Exercise: Participants conduct a live training exercise to validate the results of the prior exercises in a realistic environment using the equipment and personnel required for the TTP.
- Stage 4D – Summarize TTP: The leader summarizes the results of stages 4A-4C and sends the completed TTP summaries to the next higher level of command for approval/staffing. If a company conducts TTP development, then the battalion commander and his staff verify and approve final TTP for incorporation in the unit's TSOP.
- *STAGE 5 – IMPLEMENT*: The leader captures the set of TTPs that were developed or revised and applies them to unit standard operating procedures (SOPs), etc. The facilitator maintains all development/revision documentation in support of the leader.
- *STAGE 6 – COMMUNICATE and ASSESS*: Once the TTP is approved by the higher commander, the leader must communicate the new TTP and ensure that it is understood by all Soldiers. The leader then ensures that the TTP is incorporated into unit training programs.

The research reported here extends an earlier version of the TTP Toolbox (Topolski et al., in preparation) to include Stage 6, “Communicate and Assess.” The revised and expanded TTP Toolbox now includes the communicate methods and measures developed in the research reported here, as well as, supporting training materials, vignettes, and trainer guides.

## Method

### *Overview*

The current research explored the development and assessment of better methods and measures for communicating TTP and assessing Soldiers' understanding of TTP. Practical considerations such as time and cost limited the number of modes of communication and methods of assessment examined in the research. The approach presented TTP vignettes using varying modes of presentation and assessed Soldiers' understanding through varying methods of assessment including recall, recognition, and application.

The research team included the combined efforts of military SMEs, behavioral scientists, and simulation programmers. The research employed Soldiers participating with

operationally relevant vignettes, including simulation-based video presentations of TTP, to improve the relevance, accuracy, and applicability of findings.

### *Research Design*

The research used a within-subjects 3 x 3 factorial design, with random assignment to the extent possible (see Table 1). The independent variables were three incremental modes of communication identified as W+, G+, and V+ (respectively: Written, Graphic + Written, and Video + Graphic + Written), and three methods of assessment identified as Back Brief, Traditional Questions, and Video. The communication modes were selected based on their widely established use in the military, academia, and the private sector. Three TTP regarded as “common core,” neither branch or military speciality specific, were identified and adapted for the research including: Counter Sniper actions (CS), establishing a Traffic Control Point (TCP), and Break Contact (BC) with a superior force.

Table 1

The 3 x 3 Factorial Design Employed in the Research

		Method for Assessing TTP Understanding		
		Back Brief	Traditional Questions	Video Metric
Method for Communicating TTP	Written (W+)			
	Written + Graphic (G+)			
	Written + Video (V+)			

### *Participants*

A total of 86 active-duty Soldiers from Fort Gordon (n=26), Fort Hood (n=17), and Fort Knox (n=43) participated in the research. In prior pilot research, three ROTC cadets from Augusta State University served as participants in a review of experimental materials and procedure.

### *Materials*

The W+ communication mode consisted primarily of written materials provided in hard copy format (see excerpts in Appendix B). The materials began with a brief set of instructions informing each participant that they had 15 minutes to study the TTP before they would be required to demonstrate their understanding of the TTP. Next, a “Key Actions” paragraph identified the key actions doctrinally associated with TTP. The following section labeled “How to Fight” provided a set of tactical considerations related to the key actions. On a subsequent page, the materials provided an overview map of the area of operations annotated with graphic control measures, a brief “Situation” paragraph, and a repetition of the “Key Actions” paragraph. Notably, the W+ mode included more than written materials. However, a map and graphic control measures were judged by the research team as instrumental in properly situating participants to an applied tactical setting. A more stringent test of the W+ mode may be included in future research, as discussed under Conclusions.

The G+ mode provided the same information as the W+ mode, but formatted in a substantially different manner (see excerpts in Appendix C). After receiving the same instructions as the W+ mode participants, the G+ materials began with the closing page from the W+ materials that provided an overview map of the area of operations annotated with graphic control measures, a brief “Situation” paragraph, and a repetition of the “Key Actions” paragraph. On subsequent pages, the G+ materials separated each component (e.g., seven components in the Appendix C example) of the “How to Fight” information into “panels” that combined graphic and written information. The intent was to embed each tactical consideration into a depiction of the area of operations at designated geographic locations. The graphics were colored screen shots generated from VBS2. The research team’s SMEs selected screen shots that represented key geographical locations or events. For example, a screen shot might depict a route with potential sniper locations or the establishment of a counter-attack position. Each panel contained from one to three “How to Fight” components. Clearly, in the G+ mode TTP information was more “fragmented” or distributed than in the W+ mode.

The V+ mode provided the same information and formats as the G+ mode, but added a video-based depiction of the TTP as performed in, and captured from, VBS2. The approximately 5-7 minute videos were constructed by editing the AAR feature of VBS2 that played back demonstrations of correct and incorrect TTP performance based on TTP execution by the research team’s SMEs. The AAR playback allowed video editing from multiple perspectives (e.g., first person/friendly, third person/enemy, and God’s eye overview). For the Break Contact video, the SMEs initially selected only the God’s eye view for the video. For the Traffic Control Point and Counter Sniper videos, the SMEs selected and integrated multiple perspective views, dependent upon the actions portrayed.

The V+ mode provided the same information and formats as the G+ mode, but added a video-based depiction of the TTP as performed in, and captured from VBS2. The approximately 5-7 minute videos were constructed by editing the AAR feature of VBS2 that played back demonstrations of correct and incorrect TTP performance based on TTP execution by the research team’s SMEs. The AAR playback allowed video editing from multiple perspectives (e.g., first person/friendly, third person/enemy, and God’s eye overview). For the Break Contact video, the SMEs initially selected only the God’s eye view for the video. For the Traffic Control Point and Counter Sniper videos, the SMEs selected and integrated multiple perspective views, dependent upon the actions portrayed. Using Counter Sniper as an example, the process of video development and content was as follows:

The Counter Sniper Actions video was adapted from TTP posted on the Center for Army Lessons Learned website under Recommended Documents. The planning and execution of the video method was very similar to traditional methods in producing short films. The video was produced using actual role players executing each step of the TTP in the VBS2 simulation and recorded using the AAR function of the system. Each role player had a specific function and dialogue that was executed at the appropriate time. The dialogue was scripted to ensure each step of the TTP was accurately portrayed, and was recorded as radio traffic directly into the AAR file. The AAR file was then used to capture video and edited into its final form to accurately portray the TTP. A partial description of the video follows

focused on two Key Actions : (1) identify and check likely sniper positions; and, (2) increase Situational Awareness (SA) from 25-200 meters in urban areas.

The Counter Sniper Actions correct video opens with a “fly over” to orient the viewer to the battlefield and shows known and potential sniper locations. It then transitions to a patrol entering a village. The viewer listens in while the lead vehicle identifies likely sniper positions and suspicious vehicles to the patrol leader, who orders an increase in SA out to 200 meters. The lead vehicle is then engaged by a sniper located in the bed of a truck as it enters the outskirts of the village near check point (CP) 2. The viewer watches as the lead vehicle returns fire, kills the sniper, and listens in while this information is passed to the patrol leader, who orders the patrol to continue its mission. The video continues highlighting key correct counter sniper actions.

The other two videos were constructed in a similar manner and contained similar content. Notably, the research team modified the Break Contact video between the second and third data collection locations. Feedback from Soldiers at Fort Gordon and Fort Hood indicated the Break Contact video lacked sufficient detail and action, and that the combatants were too small to identify and track. In response, the SMEs selected and integrated multiple perspective views into the Break Contact video, similar to the other videos. Although modification confounded some results, the research team decided to implement the lesson learned and explore its impact to better identify “best practices” for communicating TTP.

Materials for the Back Brief assessment method instructed each participant to identify in writing the key actions required for the assigned TTP and then to indicate the proper sequence in which the actions should occur (see Appendix D). Several follow-on questions probed the participant’s understanding of selected key actions. Materials for the Traditional Questions included a set of approximately four to six questions in multiple-choice format (see Appendix E). The questions targeted Soldiers’ ability to identify key actions and correct application of the TTP in tactical situations. Materials for the Video measure consisted of a list of key action statements from which Soldiers identified incorrectly performed actions after viewing an additional and shorter (3-4 minute) video which included “incorrect” performance of selected key actions (see Appendix F). A video of incorrect actions for each TTP was constructed similarly to the original videos by having SMEs re-perform the TTP incorrectly in VBS2 and then editing the AAR playback.

Materials for other dependent measures captured Soldiers’ assessments of the methods used in the form of feedback scales and questionnaires (see Appendix G) and post-experiment comments from hot washes. Experimenter Logs were used to capture supplementary data on session times and other administration issues (see Appendix H), and Participant Profile Questionnaires were included to obtain relevant data on the Soldiers’ military backgrounds (see Appendix I).

### *Development of Vignette Library*

The research also attempted to broaden the potential users of the TTP Toolbox to a wide range of unit members in the Current Force. In contrast, ARI’s earlier research had focused primarily on Future Force training requirements. Therefore, only common core TTP

were selected and tested in the research reported here. The research team's SMEs selected TTP from the Center for Army Lessons Learned (CALL) website. Supporting CALL materials identified each of the TTP/battle drills as recommended readings for Soldiers prior to deployment. Three TTP -- Counter Sniper, Traffic Control Point, and Break Contact -- were selected for the communication research based on the following TTP criteria:

- Designated for platoon or squad level.
- Relevant to current theater conditions.
- Relevant to any Soldier, not specialty specific.
- Requires leader involvement.
- Replicable in VBS2, for video-based communication, and
- Executable in ten minutes or less, given experimental time constrains.

The Counter Sniper TTP and vignette are featured in Appendices B-F to provide, at least, a partial example of the methods and measures for TTP communication and assessment that were developed and tested.

The VBS2 simulation system is being used extensively by the Army to generate a "state-of-the-art" training environment. The VBS2 is a computer-based, fully interactive, three dimensional, first-person environment capable of simulating a wide range of situations at the company level and below. Users execute missions in a semi-immersive training environment that provide relatively accurate represents of varied operational environments. The system interoperates within a Live, Virtual, Constructive (LVC) environment and interfaces with U.S. Army and Joint Command and Control (C2) systems. The simulation accurately emulates most U.S. Army weapon systems and the effects of those weapons, both mounted and dismounted, and live radio traffic. The VBS2 contains a robust AAR tool allowing complete mission execution review. This AAR allows playback of the mission with radio traffic, and free camera views to allow the administrator to view the actions from any angle during the completed mission playback.

However, some notable VBS2 limitations still exist. For example, individuals "pop" out of vehicles (instead of stepping out of a vehicle), and civilians idly stand by during sniper attacks (instead of reacting to the threat). These limitations resulted in some minor artifacts and "unnatural" behaviors during the video. In addition, the research team experienced some challenges and a learning curve in navigating and compiling the various views used to construct the videos.

The research team internally vetted all the materials and experimental procedures several times during construction. In addition, a group of ROTC cadets at Augusta State University participated in a pilot study. Adjustments to the materials and procedure occurred after each round of vetting, after the pilot study, and after the second data collection to modify the BC video.

### *Procedure*

Soldier participants upon arrival at assigned "classrooms" at each installation initially signed privacy act and informed consent forms and received an experimental identification

number. All the Soldiers in each session were assigned to either an experimental or control condition as an entire group, but worked individually. Group sizes varied between one and eight Soldiers per session. Soldiers in the experimental condition received individual binders containing all of the materials for the experiment including a participant profile questionnaire, orientation slides, three sets of TTP and assessment materials, and a participant feedback questionnaire. Soldiers in the control condition received identical binders as the Soldiers in the experimental condition, but with the communicate TTP materials removed. Therefore, control participants did not study any TTP specific written, graphic, or video materials prior to the assessment period. During an initial 15-minute orientation, all participants were informed of the purpose and procedures of the experiment and instructed to work independently, ask questions at any time, and conduct the TTP assessments in “closed book” manner.

The design was a partial repeated measures design with Soldiers randomly assigned to TTP/mode of communication pairings, with mode of communication and order of presentation counterbalanced across groups. Thus, the Soldiers in the first group may have received the BC TTP in W+ mode first, the TCP in G+ mode second, and the CS in V+ mode last, while the next group of Soldiers may have received the TCP in V+ mode first, the CS in W+ mode second, and the BC in G+ mode last. Each Soldier completed all three methods of assessment per TTP/mode of communication pairings.

Following the orientation, Soldiers had 15 minutes to study the first TTP. For the W+ and G+ modes, Soldiers could use the entire 15 minutes to study the printed materials. In the V+ mode, the Soldiers had seven minutes to study the written materials prior to the video presentation. Videos were presented on either individual laptop computers equipped with headsets or via an overhead projector to the entire group, depending on classroom and equipment resources available. Following the presentation of the video, Soldiers could use any remaining time from the 15-minute interval to further study the TTP.

After the study period, the assessment period began. The research team assessed TTP understanding on several dimensions. Soldiers had 12 minutes to complete the written Back Brief, eight minutes to complete the Traditional Questions, and five minutes to complete the Video measure items. If Soldiers did not complete an assessment in the time allotted, they received instruction to stop working and proceed to the next section. Soldiers could not return to complete any assessment items they failed to complete in the time allotted. If all of the Soldiers in a group completed an assessment before the allotted time expired, the researcher proceeded to the next assessment. A member of the research team recorded study and assessment times in the Experimenter Log (Appendix H). After all three of the assessments for a TTP were completed, Soldiers as a group had the option to take a short break or proceed directly to the next set of TTP. The researchers repeated this procedure for all three TTP, after which Soldiers completed the participant feedback questionnaire and participated in a brief Hot Wash to obtain Soldiers’ open-ended comments. The feedback questionnaire contained a mix of open-ended questions and five point Likert type scales (Appendix G). Total time per session was approximately 2 hours and 40 minutes.

## Results and Discussion

Analysis stressed an exploratory, versus confirmatory, approach with a mixture of inferential, descriptive, and qualitative analyses. Inferential statistics including analysis of variance, post hoc tests, and pair-wise comparisons examined the effects of the primary independent variables, mode of communication and method of assessment, as well as several secondary variables such as, participant rank and location, TTP, and, Soldiers' ratings. The researchers categorized and summarized qualitative data from hot washes and written comments to better identify lessons learned.

### *Assessment Scoring*

The researchers scored each method of assessment separately, with each item within an assessment measure weighted equally. For example, a Back Brief assessment required the Soldiers to: a) list the five key actions (five points total, one point each), b) go back and place them in the correct order by numerating them (five points total, one point each), and c) answer two follow-up multiple-choice questions (two points total, one point each). Thus, the maximum score on Back Brief performance was twelve points. For individual test items that required multiple responses (e.g., circle all that apply), the items were graded equally for errors of omission and errors of commission. That is, Soldiers lost one point for not selecting a correct item, and one point for selecting an incorrect item. Once all the items were scored, the research team transformed the scores to percent correct to norm the data across assessment measures. The researchers then calculated averages for each Soldier according to each mode of assessment. Finally, the researchers combined the averages to provide an overall score for each Soldier according to TTP/mode of communication pairing.

### *Participant Variables*

#### *Rank*

A total of 86 active-duty Soldiers participated in the experimnt whose rank varied between E1 and O3, with an average time of service of 87.43 months ( $SD = 72.73$ ); the shortest time of service was 3 months and the longest 282 months. Soldiers' ranks were as follows: 24 (28.57%) junior rank (E1-E4), 40 (47.62%) mid-level rank (E5-E6), and 22 (26.19%) senior rank (E7-O3). As seen in Figure 2, rank varied with location,  $\chi^2(4, N = 86) = 17.11, p = .002$ . Proportionally, the sample from Fort Knox contained more junior and senior Soldiers than the other locations. Significant differences were found on Soldiers' TTP understanding as a function of rank  $F(2, 83) = 8.06, MSE = 79.47, p = .001$ , with senior rank Soldiers ( $M = 55.90, SD = 6.92$ ) performing significantly better than mid-level Soldiers ( $M = 46.70, SD = 9.71$ ) and junior level Soldiers ( $M = 47.84, SD = 9.12$ ).

#### *Location*

Soldiers' performance varied by location,  $F(2, 83) = 6.033, MSE = 82.86, p < .01$ . Sample sizes according were Fort Gordon ( $n = 26$ ), Fort Hood ( $n = 17$ ), and Fort Knox ( $n = 43$ ). Post hoc tests revealed that Soldiers at Fort Gordon performed significantly worse than those at Fort Hood or Knox, both  $p$ 's  $< .05$ , while no difference was found between Hood and



Knox,  $p = .97$  (see Figure 3). Since numerous participant variables varied according to location (rank, regiment, military training, etc.), analysis could not determine which variable(s) related to military service produced the “location” effect.

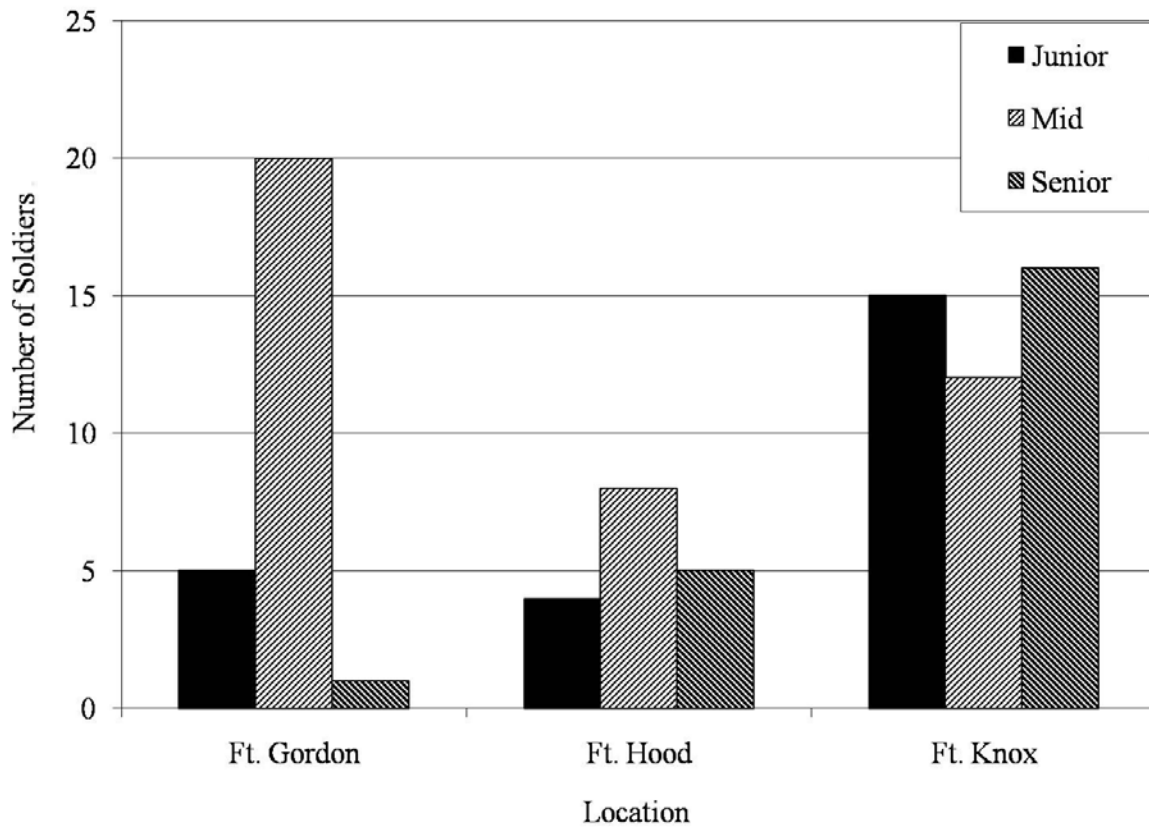


Figure 2. Soldiers’ rank by location (N = 86).

### *Modes of Communication*

The results indicated a significant main effect for mode of communication,  $F(3, 254) = 12.80$ ,  $MSE = 183.72$ ,  $p < .001$ . Post hoc comparisons revealed that Soldiers in the control condition performed significantly worse than Soldiers’ performance in any of the other three modes of communication,  $p < .05$ , (see Figure 4). This finding indicates the potential benefits of communicating TTP, including refresher training, even for TTP considered as basic or common core TTP.

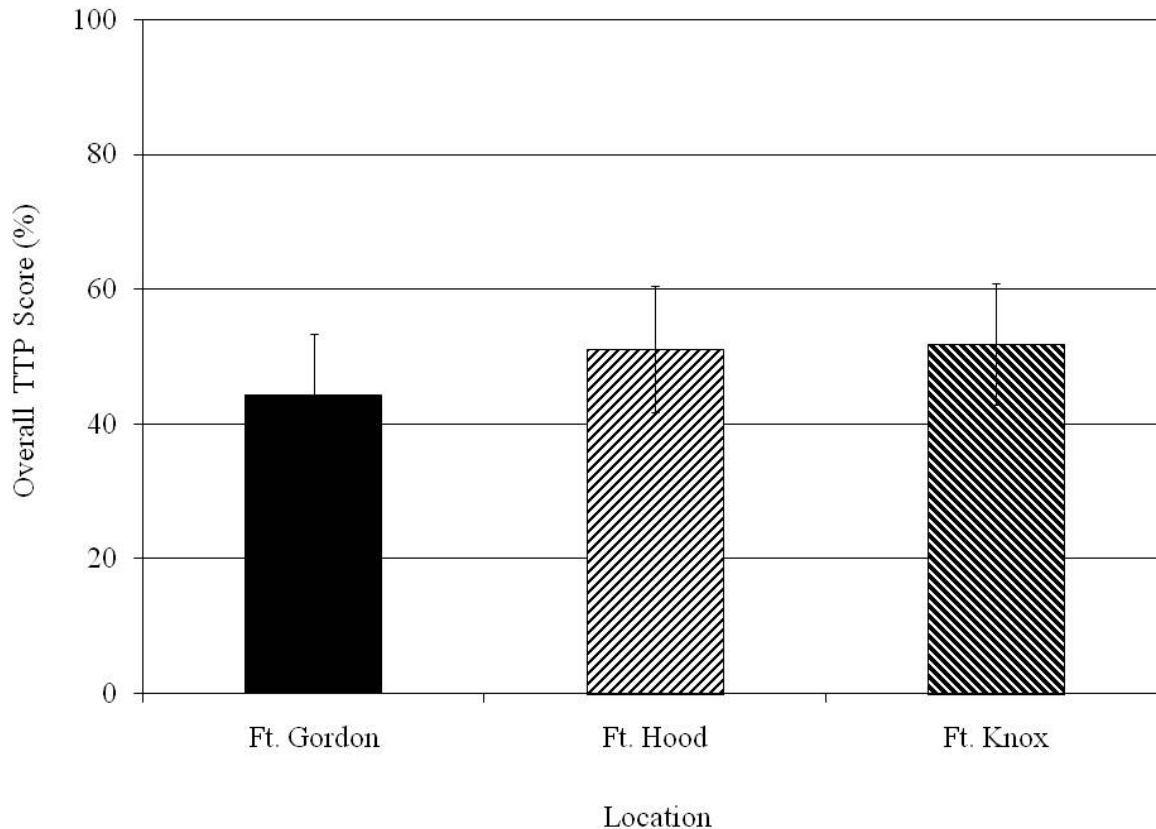


Figure 3. Soldiers’ performance by location (N = 86).

Pairwise comparisons also revealed Soldiers performed better with TTP presented in W+ mode than either the G+ or V+ modes, both  $p$ 's <.01. No difference was found between the G+ and V+ modes,  $p = .98$ . There are several possibilities why Soldiers performed better in the W+ mode. The most straightforward account might be that written media are superior for communicating TTP. Perhaps, more mixed modes of communication such as G+ and V+ are more complex or difficult than simpler modes.

However, this account is not congruent with Soldiers’ feedback. A majority of the Soldiers stated that the graphic and video materials aided their understanding. An alternate explanation is that differences between the modes of communication in the presentation of key actions and “How to Fight” procedures produced the effect. In the W+ mode, the entire TTP appeared on a single sheet of paper in an organized grouping. For the G+ and V+ modes, the TTP appeared in a series of legends dispersed across several pages of graphics (e.g., see Appendix C). The fragmented presentation style may have interfered with Soldiers’ ability to integrate information or understand the TTP. There was some evidence from Soldiers’ comments to support this hypothesis. During the initial experimental sessions, several Soldiers commented that they did not realize how the supporting legends represented the TTP. During subsequent sessions, the experimenters more explicitly informed participants during the orientation that the TTP are illustrated in the legends.

Another explanation is that the TTP assessments may not have effectively assessed Soldiers' depth of understanding and the instructional benefits provided by the G+ and V+ modes. Graphics and videos may assist in developing procedural schemas, instilling deeper knowledge on temporal order, and visualizing movement dynamics. However, back briefs and multiple-choice questions about TTP, as tested, may not be adequate to assess effects on deeper learning and TTP application.

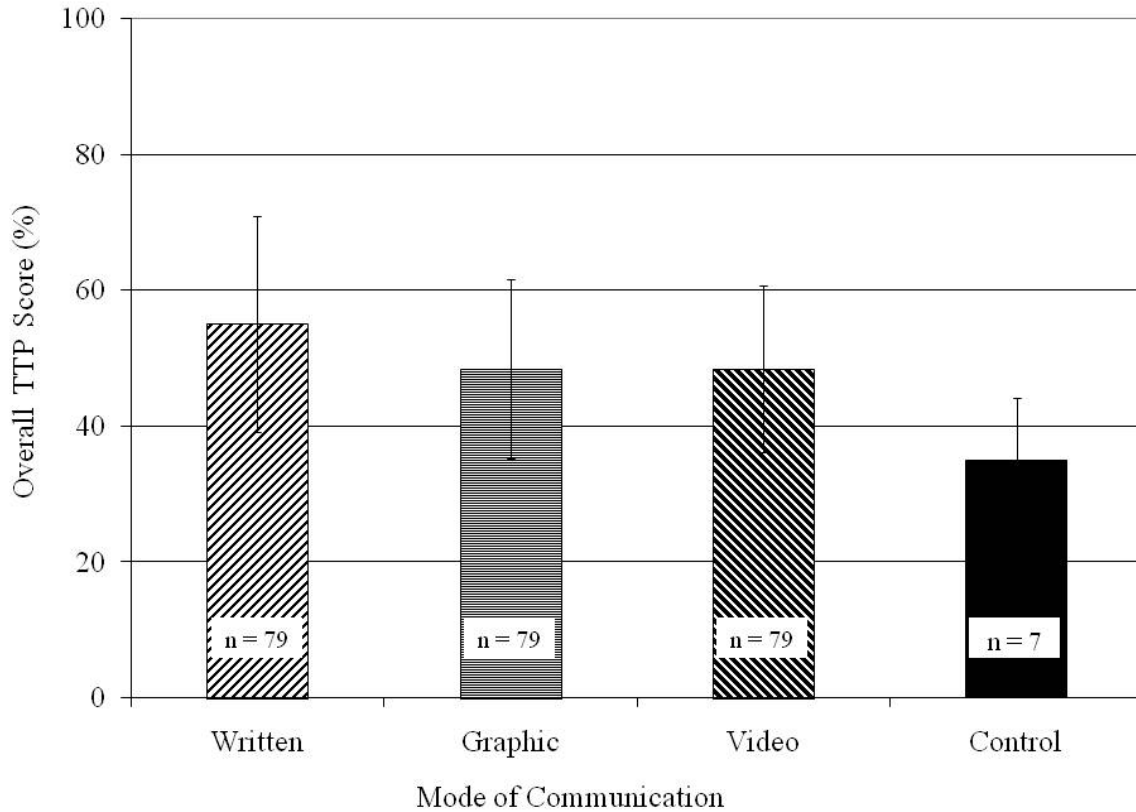


Figure 4. Soldiers' performance by mode of communication (N = 86).

#### *Differences between TTP*

A significant main effect was found for TTP,  $F(2, 170) = 56.35$ ,  $MSE = 128.79$ ,  $\eta^2 = .40$ ,  $p < .001$ . Pairwise comparisons revealed significant differences between each TTP, with Soldiers performing significantly better on Break Contract, followed by CS, and finally TCP, all  $p$ 's  $< .01$ , see Figure 5.

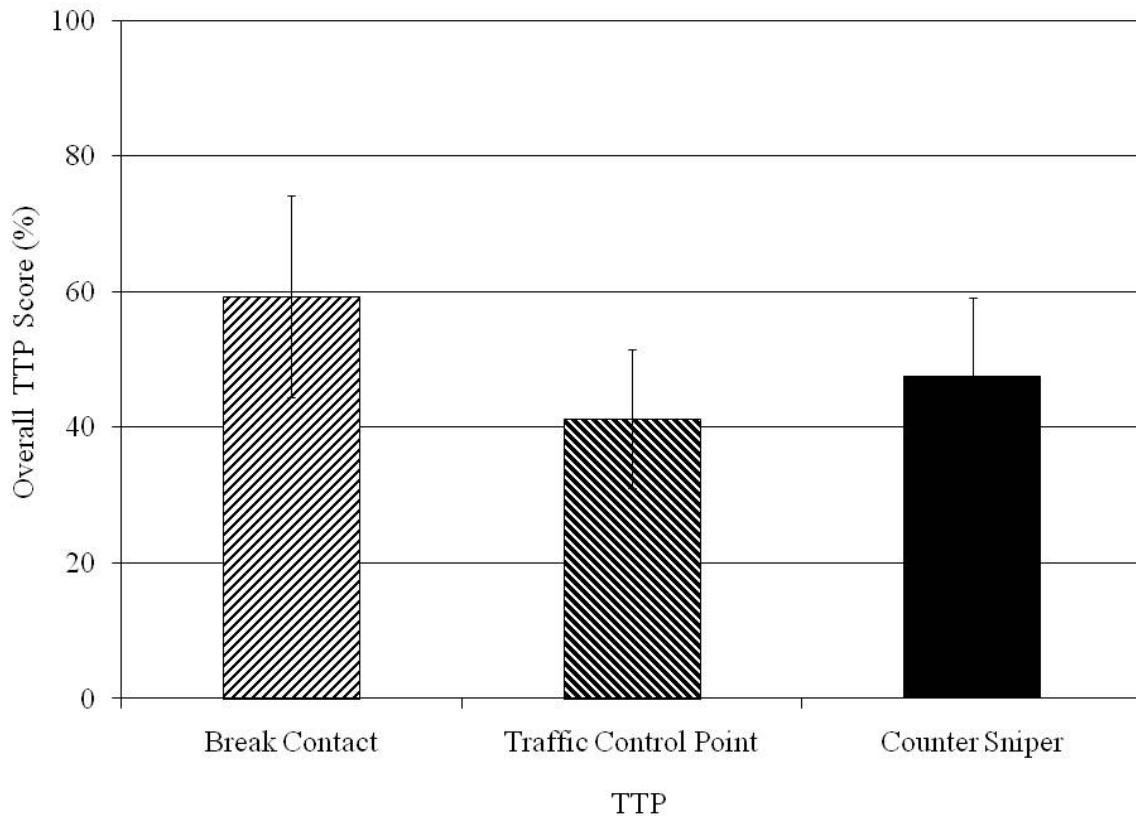


Figure 5. Soldiers' performance according to TTP (N = 86).

#### *Methods of Assessment*

The results indicate a significant difference according to method of assessment,  $F(2, 170) = 80.94$ ,  $MSE = 126.60$ ,  $\eta^2 = .47$ ,  $p < .001$ . Pairwise comparisons revealed significant differences between each method of assessment, with Soldiers performing significantly better on Traditional Questions, followed by Video, and finally Back Brief, all  $p$ 's  $< .01$  (see Figure 6). The lower scores on the Back Brief assessment were in large due to the poor performance on the "go back and number the key elements in their correct order" component of that assessment. Soldiers listed 51.01% ( $SD = 20.21$ ) of the key actions correctly, but only placed 20.54% ( $SD = 18.92$ ) of the items in the correct order,  $t(85) = 19.91$ ,  $p < .001$ . Several Soldiers (23%) failed to indicate the order of the key actions on one or more of the TTPs, which partially explains the decrement in performance.

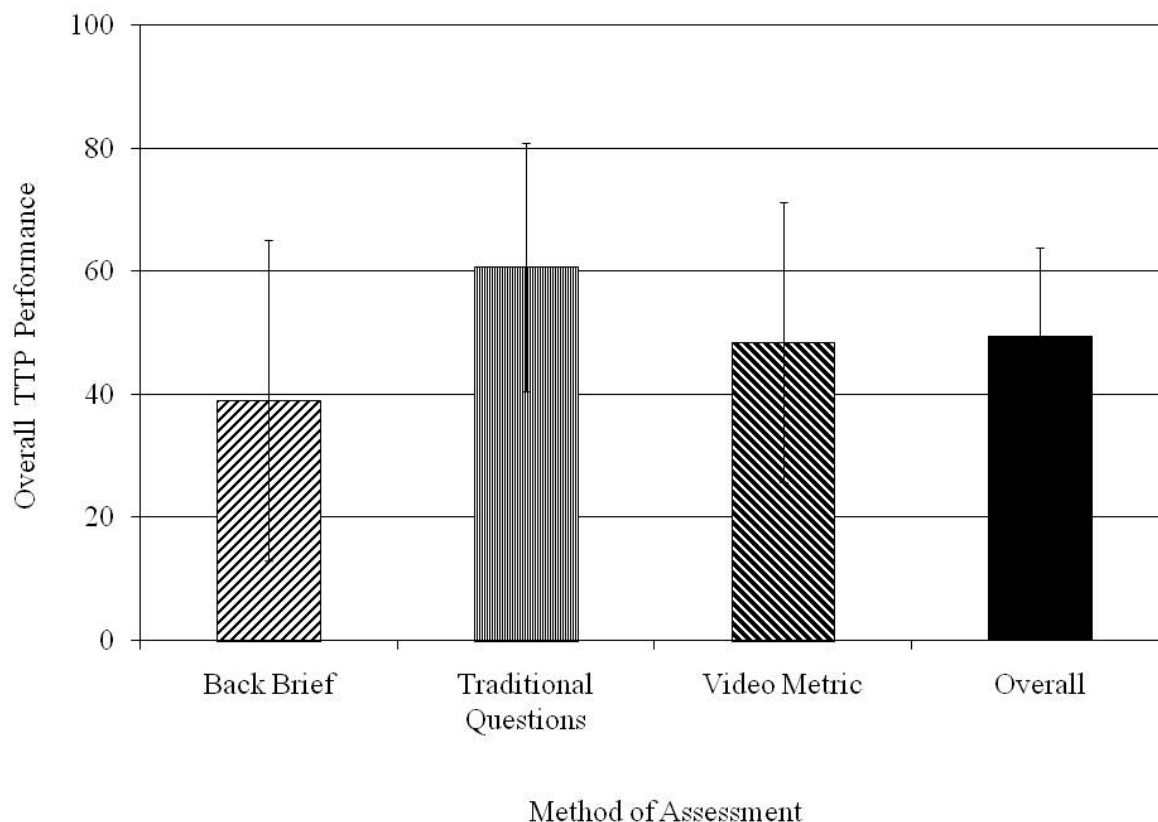


Figure 6. Soldiers' performance by method of assessment (N = 86).

### *Higher Order Effects*

Several two-way interactions between the independent variables were explored for significant differences. Some significant differences emerged, but they were not systematic. For example, while the scores on the Video measure were significantly higher on TCP than CS, an opposite trend occurred on the Traditional Questions. The inconsistency of such results and small sample sizes made the elimination of specific experimental artifacts impossible (e.g., variability in stimuli, difficulty of assessment items, etc.). Thus, higher order analyses are not included in this report unless otherwise noted.

### *Feedback Data*

Soldiers provided feedback on a series of questions designed to assess their perceptions of the modes of communication, methods of assessment, task difficulty, and usability of the experimental materials and procedures. Soldiers responded by rank ordering items, responding to a series of five point Likert type scales (with 1 representing lower ratings and 5 representing higher ratings), and open-ended questions. The researchers performed qualitative analyses on Soldiers' written comments to open-ended questions and comments recorded during hot washes. Selected comments and summaries are included throughout the results to provide converging support for the numerical data.

### Rank Order Data

The research team transposed all of the rank order data for presentation purposes. That is, items with the highest-ranking of “1” were assigned the largest value numerical value of “3” and vice-versa, so that higher ranks correspond to taller columns in the figures below.

#### *Modes of Communication*

A significant difference was found by conducting a Friedman's test for rank ordered data for mode of communication,  $\chi^2(2, N = 75) = 92.24, p < .001$ . A series of Wilcoxon signed rank tests indicate that Soldiers overwhelmingly chose V+ as the best mode of communication, followed by G+, and finally W+, all  $p$ 's  $< .01$  (see Figure 7). Data from the hot washes and written comments support this finding. Soldiers often commented that the video allowed them to “visualize” how the TTP should be conducted. A typical response was “Watching the video allows us to see how the TTP plays out. It allows us to understand what to do and when to do it.”

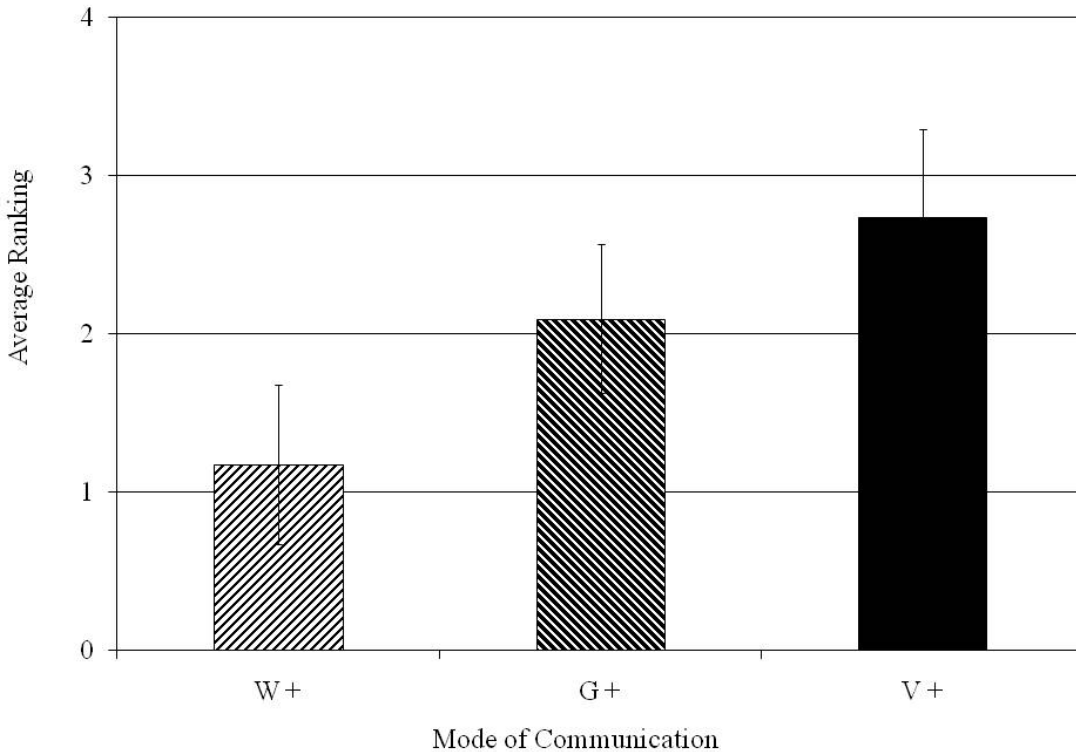


Figure 7. Average ranking for mode of communication (N = 79).

#### *Methods of Assessment*

The feedback on method of assessment was less consistent. No significant differences were found,  $\chi^2(2, N = 78) = 2.80, p = .25$ . As seen in Figure 8, each method of assessment received support from Soldiers. Again, the qualitative data paralleled the results. Soldiers often expressed opposing views regarding the strengths and weaknesses of each method of

assessment. For example, a Soldier stated a shortcoming of the Back Brief is “it only shows that someone can remember a list of steps, not that they understand how, or when to execute them,” whereas another Soldier emphasized the strengths of a Back Brief, “it’s a quick and effective method for a commander to gauge if his Soldiers understand the mission.”

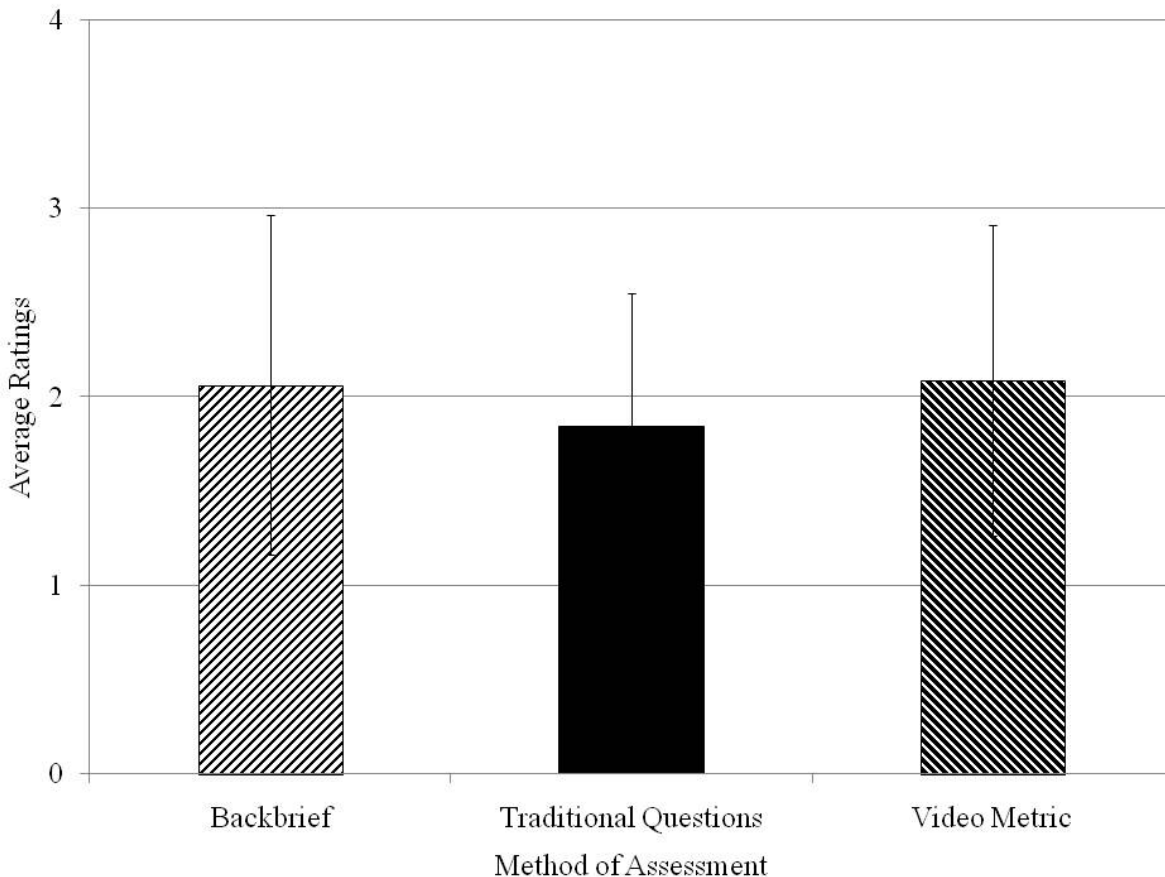


Figure 8. Average ranking for method of assessment (N = 79).

#### *Perceived Usability of Materials and Procedure*

Soldiers’ perceptions on the willingness of commanders to use certain communication modes and assessment methods in their unit revealed significant differences,  $\chi^2(4, N = 237) = 14.68, p = .005$ . For example, fewer Soldiers believed that commanders would be capable or willing to employ the Video assessment method (43.59%) compared to either the Back Brief (64.94%) or Traditional Questions (72.03%). Soldiers’ comments on communication modes and assessment methods mirrored these findings. Comments often centered on concerns regarding the perceived limitations with presenting videos in operational settings. That is, the limited availability of video playback technology in the field would hinder a commander’s ability to use video to either communicate TTP or assess Soldiers’ knowledge.

### *Feedback Data from Scales*

The data from the feedback scales show a clear preference for the V+ mode of communication. Across all items, V+ received average ratings above 4 (4 = “Agree”) with an overall average rating of 4.27, while G+ and W+ modes received progressively lower ratings of 3.93 and 3.62, respectively. A series of post hoc comparisons were conducted using Scheffe’s method of correction for multiple comparisons. As can be seen in Table 1, Soldiers had significantly higher ratings for the V+ communication across all items than the W+ mode, and a majority of the items when compared to the G+ mode. The G+ mode of communication also received higher ratings than the W+ mode on a majority of the items.

Table 2

Soldiers’ Feedback Data

Question	Mean (SD)			p-value		
	W+	G+	V+	W-G+	W-V+	G+-V+
Portrayed Environment Realism	3.48 (.86)	3.86 (.69)	4.27 (.80)	.01*	<.01*	<.01*
Provides Enough Information	3.70 (.90)	4.03 (.55)	4.29 (.69)	.02*	<.01*	.07
Enemy Realism	3.47 (.87)	3.84 (.72)	4.23 (.77)	.02*	<.01*	<.01*
Allows Me to Visualize Environment	3.58 (.91)	4.05 (.62)	4.41 (.71)	<.01*	<.01*	.01*
Allows Me to Visualize Execution	3.65 (.94)	4.00 (.64)	4.33 (.68)	.02*	<.01*	.03*
Consider and Decide Course of Action	3.68 (.73)	3.94 (.61)	4.28 (.66)	.06	<.01*	<.01*
Provides Realistic Enemy Tactics	3.48 (.74)	3.68 (.63)	4.10 (.83)	.25	<.01*	<.01*
Concretely Demonstrates Execution	3.57 (.87)	3.91 (.67)	4.18 (.79)	.02*	<.01*	.1
Engaged Me in Thought	3.94 (.80)	4.05 (.62)	4.30 (.72)	.6	<.01*	.09
Clear Communication/Easy to Understand	3.68 (.89)	3.95 (.68)	4.25 (.81)	.11	<.01*	.06
Overall Average (SD)	3.62 (.85)	3.93(.64)	4.27(.74)			

*Note.* \*- significant at .05

### *Effects of Video Modification*

As noted, Soldiers identified shortcomings in the Break Contact video during data collections at Forts Gordon and Hood. Therefore, the researchers modified the video to clarify the parts of the video Soldiers found inadequate, such as a need for perspective views, and presented the modified views at the Fort Knox data collection. The effects of video modification were examined by comparing Soldiers’ performance in the V+ mode for Break Contact at Fort Gordon and Fort Hood (N = 15) to Soldiers’ performance at Fort Knox (N=12). Analysis across all three assessment methods produced a significant difference with Soldiers scoring higher after video modifications (M = 59.51, SD = 14.07) than before (M = 47.40, SD = 14.45),  $t(25) = 2.19$ ,  $d = .85$ ,  $p = .04$ . However, the results are not conclusive as several participant variables co-varied with video modification such as rank and location. For example, Fort Knox had six senior Soldiers in the V+ mode for Break Contact, whereas Fort Gordon and Fort Hood only had one total. Given small sample sizes, no firm conclusion is



warranted. However, participants at Fort Knox did not stress perspective shortcomings in the modified Break Contact video.

### *Written Statements and Hot Wash Comments*

Soldiers' comments were generally positive regarding the goals, procedures, and materials of the research. Many statements by Soldiers stressed the value of having structured methods for developing and communicating TTP. The benefits cited included "it provides a quick and effective way to let other units to know about new techniques we are using to combat insurgents," and "this would make it easier for me to get my unit to understand what we are doing." Overall, Soldiers found the procedures and materials "straightforward" and "easy to understand." Some Soldiers did express concerns regarding the additional time required to produce some of the materials and the availability of required equipment in the field. Sample comments echoing these concerns were "who would have time to do all this," and "would every unit have their own colored printers and video software?" Conversely, many Soldiers endorsed the use of Wiki and the TTP Toolbox to develop and share TTPs, as discussed during session in-briefs and hot wash discussions, with comments such as "a natural fit" and a "great way for Soldiers to develop materials for the Wiki."

### Conclusions

Given the exploratory nature of the research conducted, no firm conclusions based on Soldiers' performance data are warranted. The findings suggest, however, that the three modes of communication examined resulted in significantly better Soldier understanding of TTPs. Written communications appeared to produce the best understanding of TTP, as tested. However, this finding conflicts with previous research on the use of multi-media to increase understanding (Moreno, 2006; Wampler, et al., 2006). It also conflicts with Soldiers' ratings that assigned the highest overall positive feedback to graphic and video communications. Soldiers' ratings were consistent with research that indicates individuals prefer alternate types of media presentations to supplement written text when learning (Burnham, 1992; LeFevre & Dixon, 1986; Nickerson, 1965; Stone & Glock, 1981).

The operational definitions for developing the communication modes and assessment methods used in this research were also exploratory and further refinement is recommended. The "written" mode included a map with graphic control measures to help situate participants to an applied tactical setting. A more stringent alphanumeric-only mode might be examined that would reflect common instances of military communication such as text messages and voice-only transmissions. The graphic and video communications used were multi-media formats that assumed incremental benefits from supplementary modes. However, they tended to disperse information in more fragmented formats (e.g., series of legends dispersed across several pages) which may have interfered with Soldiers' ability to integrate information or understand the TTPs.

Mainly, it is not clear that the modes of assessment used in this research adequately assessed Soldiers' understanding of TTP. Perhaps, none of the assessment methods effectively assessed Soldiers' depth of understanding or the anticipated benefits of graphic and video modes of communication. In particular, there are limitations to Back Brief assessments that require only declarative knowledge of key actions, even action sequences,

rather than direct probes or conditions that require application of TTP understanding. However, Soldiers' performance data and feedback indicate the Back Brief is an acceptable and practical assessment method.

A practical reality is that communication and assessment methods in military settings, especially operational environments, must balance efficiency and effectiveness. The most efficient methods may not be effective. Conversely, methods that are more effective may prove too costly, too technical, and too impractical. Accordingly, a "one-size-fits-all" answer may not be optimal for communicating or assessing Soldier's understanding of TTP. That is, some modes of communication may work well for TTP with certain key actions and tasks while alternate modes may be best suited for other TTP with different key actions and tasks. All TTP are not equally sophisticated or complex and may not require the same detail and precision in communication or the same depth of understanding.

### Recommendations

The growing need for new TTP adapted to new operational requirements and new materiel requires that units receive assistance in communicating TTPs and assessing Soldiers' understanding of TTPs. An earlier version of the TTP Toolbox provided units an integrated set of methods and materials to develop new TTPs (Topolski et al., in preparation). However, new TTPs must be communicated to, and understood by, unit personnel.

The exploratory research reported here indicates that Soldiers' understanding of even basic or common core TTP can, and probably should be, improved and that improvements can be gained fairly quickly. The research also indicates that many Soldiers' prefer multi-media formats, including supplementary graphics and video for the communication of TTPs.

This report's primary recommendation is that more research is needed to refine and validate methods and measures for communicating and understanding TTPs. In support of that research, Table 3 identifies an initial set of guidelines for communicating TTP by the communication modes examined. The guidelines are presented as an emerging set of "best practices" for communicating TTP based on current and previous research.

Experiential and experimental evidence confirms the advantages of communications that "show" as well as "tell." Therefore, a related recommendation is that future research should examine how to develop optimal graphic and video formats for conveying TTP. In support of that research, recommendations on how to advance this line of research based on current and prior research are listed below.

- Modify modes of communication to incorporate additional information about TTP.

In Smith and Goodman's (1984) research, instructions that emphasized either the structure or the function of a task were superior to linear instructions. The additional information contained in instructions came in the form of explanatory statements about the steps to be followed.

Kieras and Bovair (1984) suggest that knowing how a system works allows one to infer how to operate it. Providing a model of how something works is a way of making operating procedures meaningful, which in turn can allow the information to be better learned and remembered. Seemingly, providing information regarding the how and why, as well as the overall goal, seems to increase understanding.

Table 3

TTP Communication Guidelines

Technique	Best Practices
Written	<ul style="list-style-type: none"> <li>• Use written presentation as the primary means for communicating TTP.</li> <li>• State the purpose or goal of the TTP to frame the big picture.</li> <li>• Organize the TTP steps or elements (how to fight) in clear order of execution.</li> <li>• Follow standard Army style – bottom line up front, concise bullets.</li> <li>• Organize the information for easy comprehension – one step or thought per bullet.</li> <li>• Include explanatory information when “why” aspects are not self-evident.</li> <li>• Limit the presentation to two levels of information, as a general rule.</li> <li>• Unit Leaders should ensure that the TTP is clearly conveyed and supports the Commander’s intent.</li> <li>• A best practice may include vetting the TTP with another unit or leader to ensure clarity in written form.</li> </ul>
Graphic	<ul style="list-style-type: none"> <li>• Use graphics (sketches, photos, screen shots, etc.) when they substantially clarify the written TTP.</li> <li>• Keep the graphics simple – eliminate clutter and distracters.</li> <li>• Avoid embedding TTP steps within graphic materials.</li> <li>• Use multiple views (God’s-eye, first person, third person) as needed.</li> <li>• When using multiple views, sequence them for orderly drill-down flow.</li> <li>• Include a legend as necessary to explain friendly troops, enemy, equipment, etc.</li> <li>• Link graphic elements to written TTP steps, as much as possible.</li> </ul>
Video	<ul style="list-style-type: none"> <li>• Create video materials (e.g., VBS2 playback files) when written and graphic materials are not sufficient.</li> <li>• Use video materials to illustrate correct execution of all or part of the TTP steps.</li> <li>• Avoid embedding TTP steps within video materials.</li> <li>• Include multiple views (God’s-eye, first person, third person) as needed.</li> <li>• When including multiple views, sequence them for orderly flow.</li> <li>• Provide legends and markers to identify friendly troops, enemy, equipment, etc.</li> <li>• Pause the action to explain or clarify key points, as necessary.</li> </ul>

▪ Increase Soldiers’ experience/exposure to TTP.

Differing levels of experience have an effect on performance. Klein, Calderwood, and MacGregor (1989) suggest that superior decision making ability is due to skill at recognizing situations as typical and familiar; a skill which is developed through experience.

Also, Dyer, Singh, and Clark (2005) found that Soldiers from an Infantry Officer Basic Course (IOBC) performed better than Soldiers from a one station unit training (OSUT) training course. Since Soldiers from IOBC had longer and more advanced training than Soldiers from OSUT, Dyer et al., suggest that Soldiers from IOBC had a greater ability to learn in the training environment due to their higher level of experience.

Senior rank Soldiers outperformed mid-level and junior level Soldiers in the current experiment. Although such a recommendation seems obvious, providing additional experience with TTP should aid in Soldiers' understanding of TTP. Simply increasing Soldiers' exposure to TTP may facilitate greater understanding during training, although future study is needed to validate this suggestion.

- Videos should incorporate a visible speaker that directs attention to key elements.

Incorporating a speaker who can use non-verbal cues to direct attention in videos is a beneficial technique for developing training videos. Lusk and Atkinson (2007) showed that videos in which a speaker used locomotion, gaze, and gestures to direct learners' attention were superior to videos in which the speaker was a non-visual, voice-only entity. The narrators can explain procedures, providing information regarding the how and why of TTP (Kieras & Bovair, 1984; Smith & Goodman, 1984). Additionally, Salas et al., (2009) recommend that demonstration-based training direct the learner's attention to relevant cues.

- Videos should highlight key elements and provide feedback.

Athletes in Williams, Ward, and Chapman's (2003) study had greater performance after completing training utilizing a video that highlighted key elements and provided feedback about training material compared to athletes who watched an instruction-only video. The training video produced successful transfer to a field setting.

Training videos should be designed to highlight key elements and either provide feedback information directly, or allow instructors/facilitators to pause the video and provide Soldiers with feedback about the training material through probing questions.

- Demonstrate both correct and incorrect actions during training.

Salas et al, (2009) point out that trainers often only demonstrate to trainees the correct behaviors to achieve a goal. However, observers can identify incorrect behaviors better than correct ones in a training demonstration (Jentsch et al., 2001). Using a mix of both positive and negative models allows trainees to generalize their training and develop a greater understanding of the wide range of situations they may encounter (Baldwin, 1992).

- Explore the effectiveness of new technologies to optimize TTP communication and assess understanding of TTP.

Computer and video game-based simulations are being utilized and refined for Army training. For example, experts are creating short, 3-dimensional simulations of insurgent attacks in real-time for units preparing to deploy (Jean, Erwin, & Wright, 2009). The training simulations are flexible and allow the user to adjust the scenario to suit training needs. The U.S military records actual incidents, replicates the events in a simulation, and distributes the training material in about four days. The Soldiers can then review the simulations and train prior to executing a task. The U.S. Army can examine how to marry new software that measures Soldiers' performance during these simulations to evaluate their understanding of the TTP (Jean, 2009).

The Army is investing in better and more distributed ways to communicate TTP to Soldiers including mass collaboration via the internet to produce new knowledge (Fallis, 2008). Research on TTP communication and assessment should support this effort in collaboration with the Army's recently established Wiki site for TTPs on <http://www.army.mil/AKO/>.

The research reported here demonstrated an innovative use of pre-recorded VBS2-based videos to illustrate and situate TTP performance, including correct and incorrect execution of key actions. Research on TTP communication and assessment should examine how to provide similar high-fidelity communications and training on TTPs that can be readily delivered (e.g., to computers and cellphones) to multiple users and locations ranging from classroom to deployment (Lawlor, 2009).

In sum, future research should address the growing need and emerging potential to improve the communication of TTP and Soldiers' understanding of TTP. Better TTP communication and assessment methods will significantly improve the chances of mission success, reduce the likelihood of casualties, and increase the efficiency and effectiveness of training and operation.



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Appendix A  
Acronyms and Abbreviations

AAR	After Action Review
AKO	Army Knowledge Online
ARI	U.S. Army Research Institute for the Behavioral and Social Sciences
BLUF	Bottom Line Up Front
BC	Break Contact
BCT	Basic Combat Training
C2	Command and Control
CALL	Center for Army Lessons Learned
CP	Check Point
CS	Counter Sniper
DA	Department of the Army
FLEX	Flexible Method of Cognitive Task Analysis
FLEX-TTP	Flexible Method for Developing TTP
FOB	Forward Operating Base
FRAGO	Fragmentary Order
G	Graphic
GW	Graphic Written Mode of Communication
HMMWV	High Mobility Multipurpose Wheeled Vehicle
IED	Improvised Explosive Device
IOBC	Infantry Officer Basic Course
LVC	Live, Virtual, Constructive
MAPEX	Map Exercise
METT-TC	Mission, Enemy, Terrain and Weather, Troops and Support, Time Available, and Civilian Considerations
MSR	Main Supply Route
OPORD	Operations Order
OSUT	One Station Unit Training
ROTC	Reserve Officers' Training Corps
RPD	Recognition-Primed Decisions
RFI	Rapid Fielding Initiative

SA	Situational Awareness
SME	Subject Matter Expert
SOP	Standard Operating Procedures
ST-TTP	Soldier Tools for Developing TTP
TADSS	Training Aids, Devices, Simulators, and Simulations
TCAP	Tactical Command Post
TCP	Traffic Control Point
TLAC	Think Like a Commander
TSOP	Tactical Standing Operating Procedures
TTP	Tactics, Techniques, and Procedures
V	Video
VBS2	Virtual Battlespace 2
VGW	video graphic written mode of communication
W	Written Mode of Communication

## Appendix B

Written (W+) Mode of Communication

### **TTP – Counter Sniper**

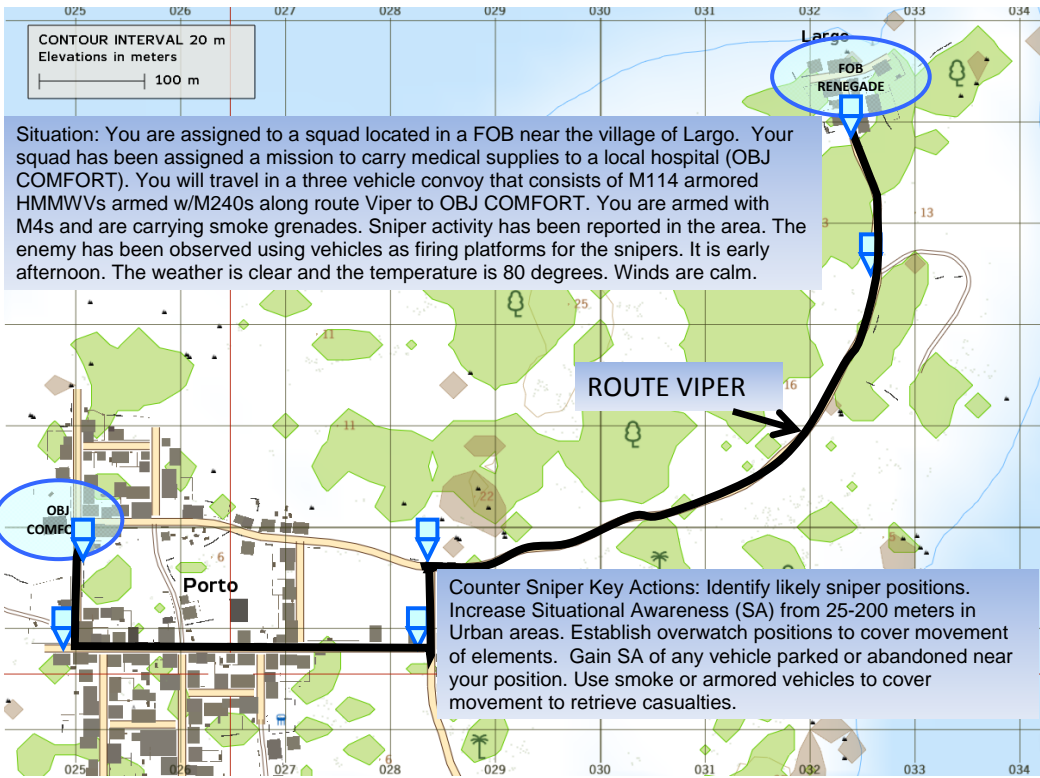
**Instructions: You will have 15 minutes to study this TTP. Then you will demonstrate your understanding of the TTP.**

**Key Actions:** Identify and check likely sniper positions. Increase Situational Awareness (SA) from 25-200 meters in Urban areas. Establish overwatch positions to cover movement of elements. Gain SA of any vehicle parked or abandoned near your position. Use smoke or armored vehicles to cover movement to retrieve casualties.

**How to fight:** The enemy may use parked or abandoned vehicles as a firing platform . Therefore, it is imperative to identify these vehicles. The enemy may hide in the trunk of a parked vehicle and fire from a port in the trunk that is oriented toward a likely avenue of approach.

Also, be suspicious of any vehicle seen driving by more than once. Stop and search these vehicles. Scan for vehicles that may be parked and postured for an attack such as a car with its trunk oriented on an avenue of approach.

The enemy may also use “bait” to draw in friendly forces. This may be a dead body, an IED or an injured Soldier or civilian. Expect sniper attacks when responding to a baited situation. Use cover such as an armored vehicle to respond to the baited situation or employ smoke to conceal movement. When fired upon change location and seek cover 90 degrees from the direction of the shot. Keep exposed personnel in motion. The enemy is also setting up on vehicles waiting for troops to return to the vehicles. Reposition vehicles before movement.

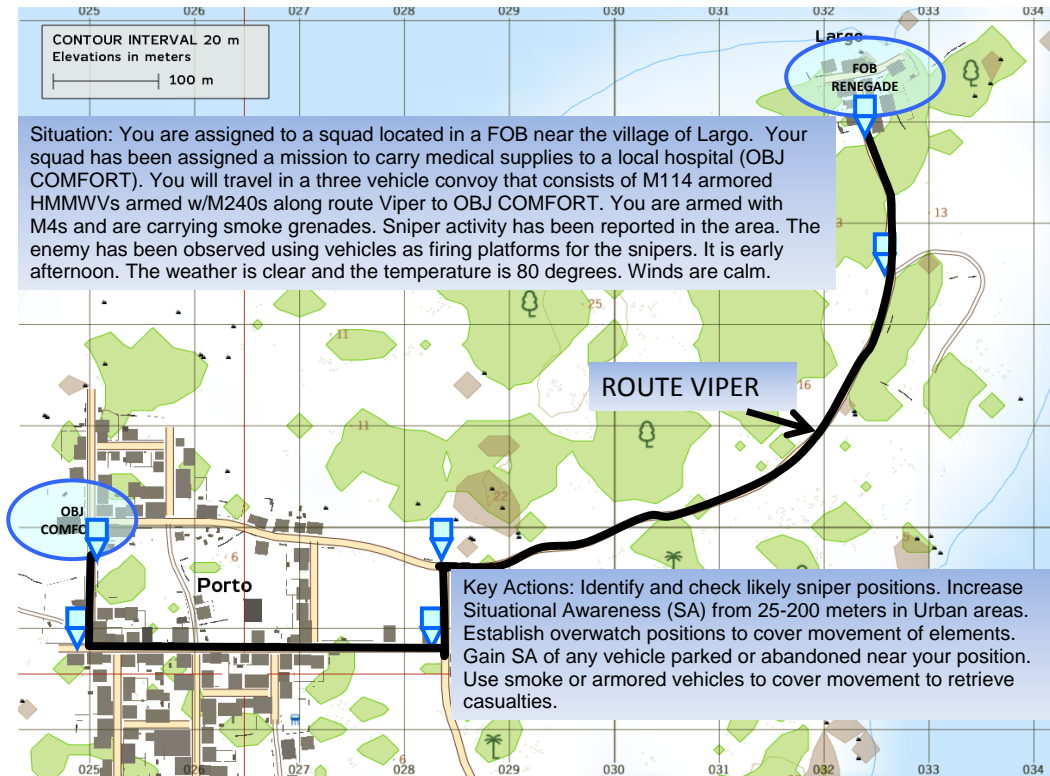


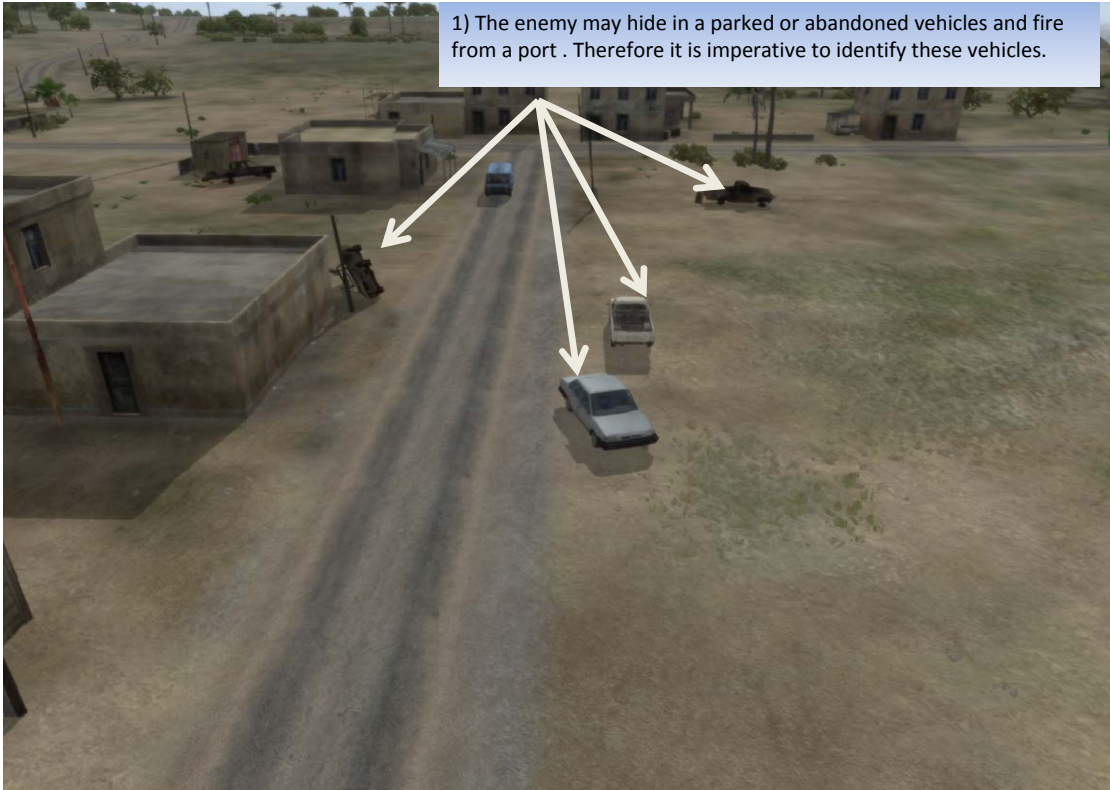
## Appendix C

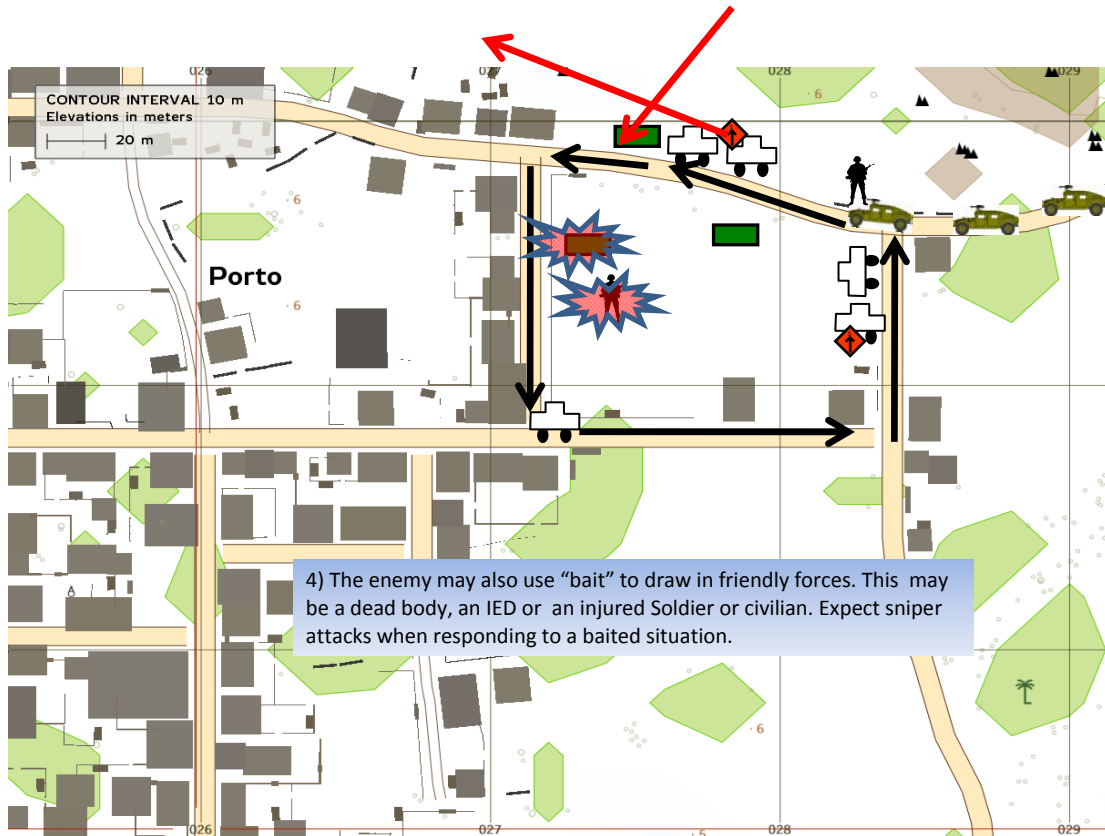
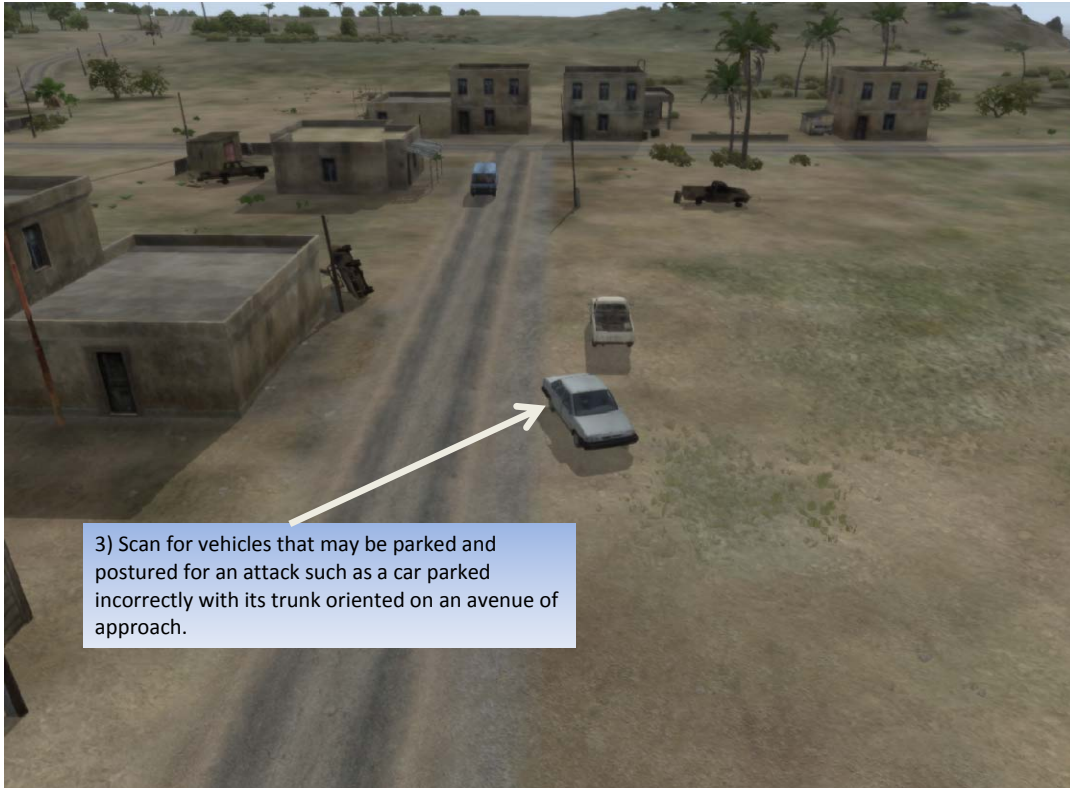
### Graphic (G+) Mode of Communication

# TTP – Counter Sniper Actions

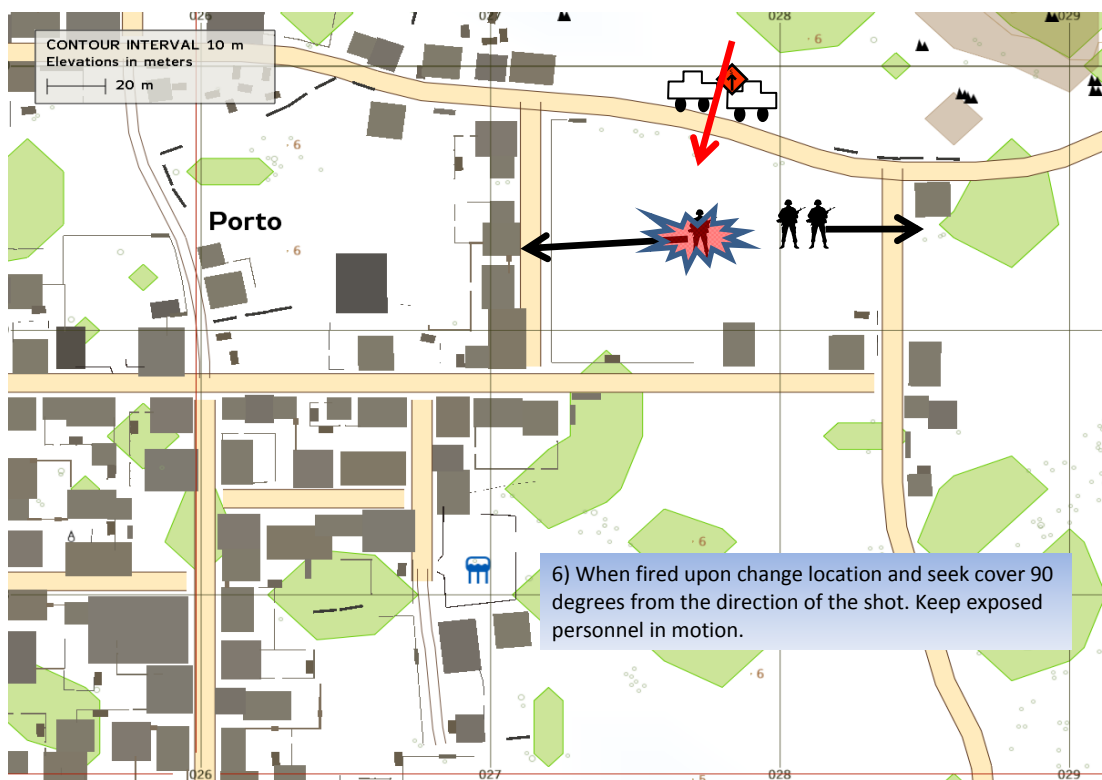
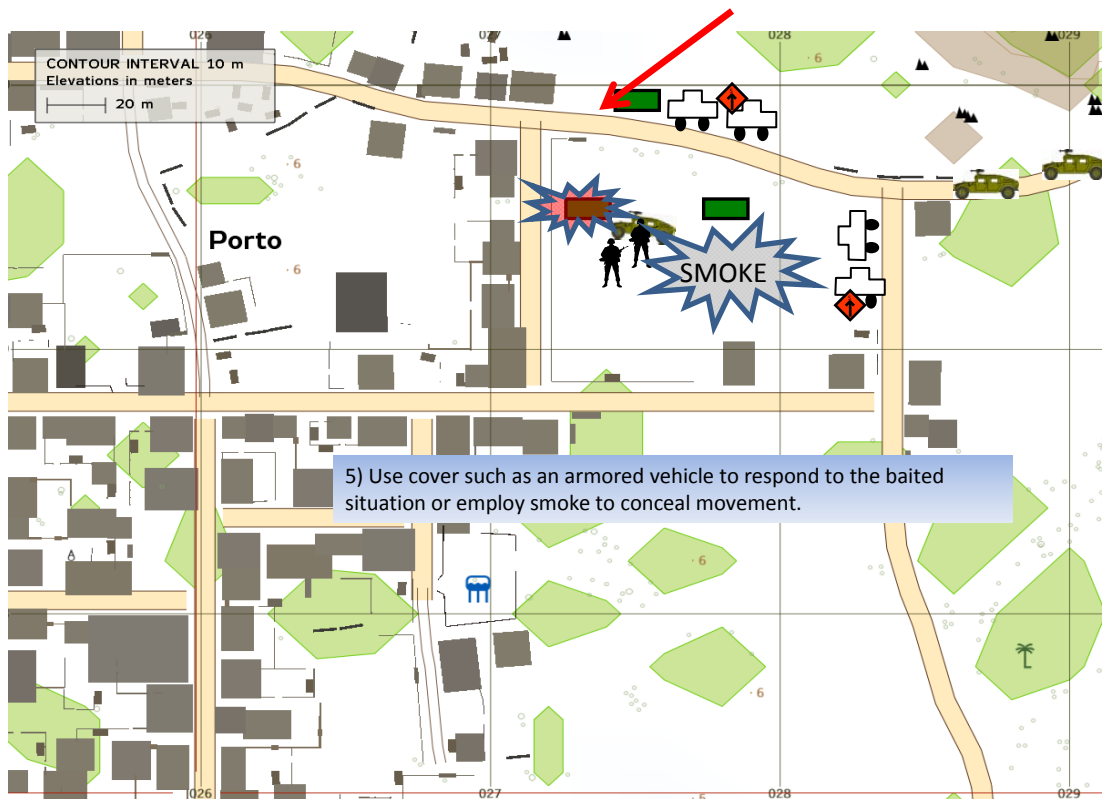
**Instructions: You will have 15 minutes to study this TTP.  
Then you will demonstrate your understanding of the  
TTP.**

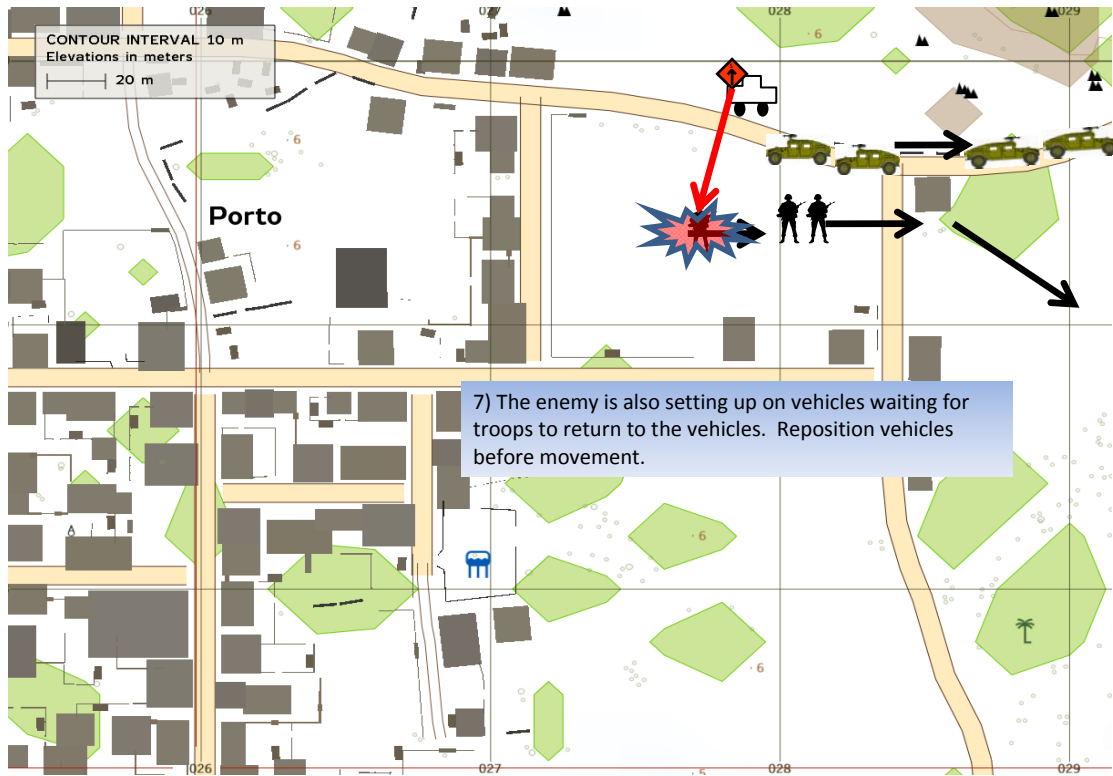








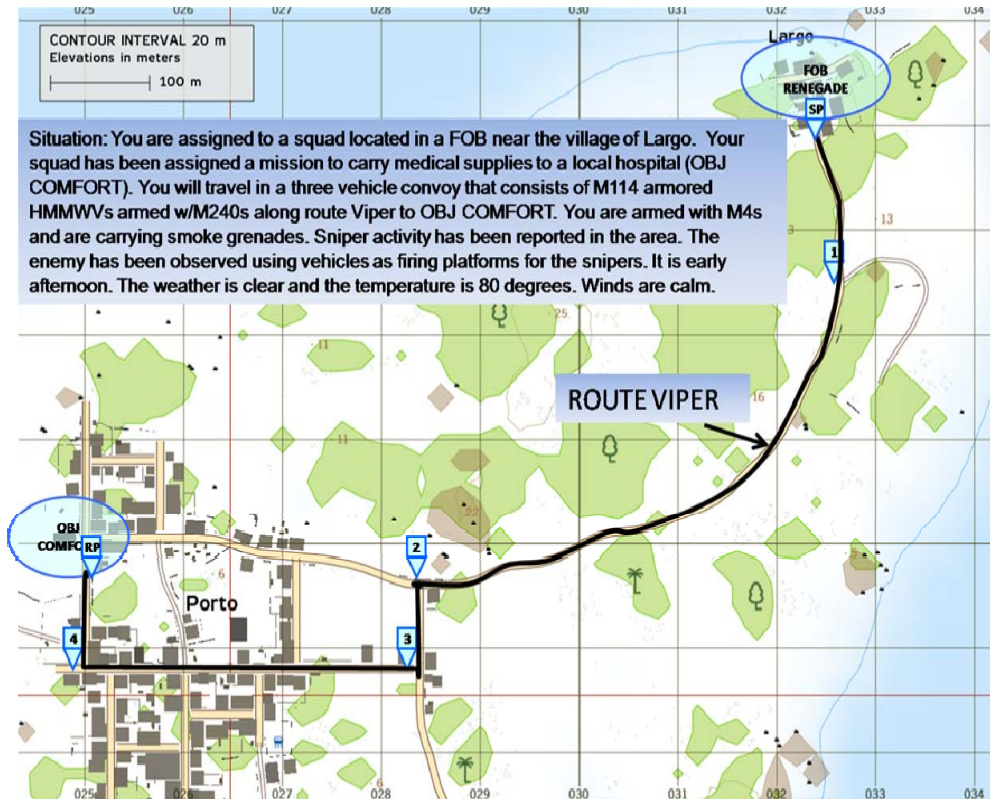




## Appendix D

### Video Mode of Communication

# Video (V+) Mode of Communication TTP – Counter Sniper – Correct Key Actions



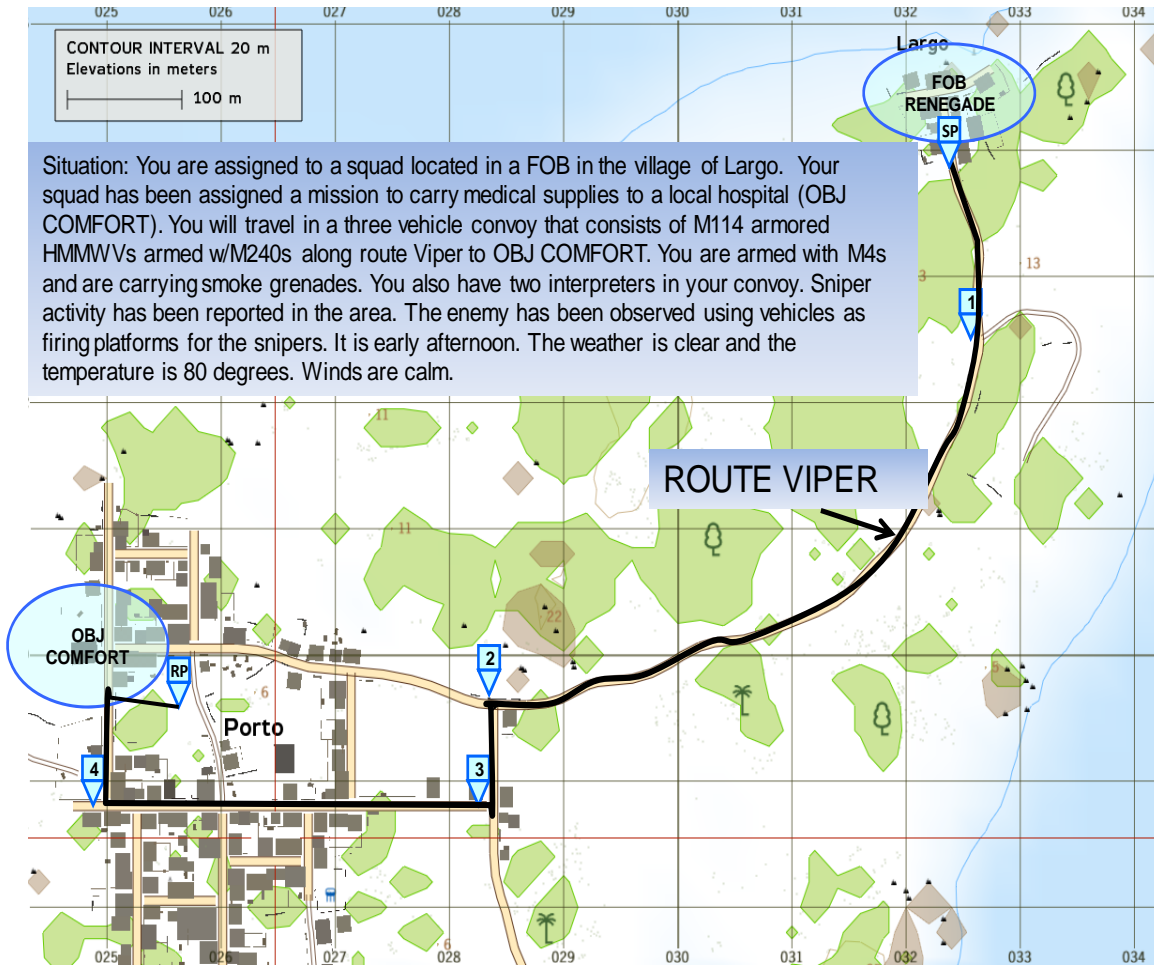
**Video Overview.** The Counter Sniper Actions video was adapted from TTP posted on the Center For Army Lessons Learned website under Recommended Documents. The planning and execution of the video method was very similar to traditional methods in producing short films. The video was produced using actual role players executing each step of the TTP in the VBS2 simulation and recorded using the AAR function of the system. Each role player had a specific function and dialogue that was executed at the appropriate time. The dialogue was scripted to ensure each step of the TTP was accurately portrayed, and was recorded as radio traffic directly into the AAR file. The AAR file was then used to capture video and edited into its final form to accurately portray the TTP. A partial description of the video follows focused on two Key Actions: (1) Identify and check likely sniper positions; and, (2) Increase Situational Awareness (SA) from 25-200 meters in urban areas.

**Correct Key Actions.** The Counter Sniper correct video opens with a "fly over" to orient the viewer to the battlefield and shows known and potential sniper locations. It then transitions to a patrol entering a village. The viewer listens in while the lead vehicle identifies likely sniper positions and suspicious vehicles to the patrol leader, who orders an increase in SA out to 200 meters. The lead vehicle is then engaged by a sniper located in the bed of a truck as it enters the outskirts of the village near CP 2. The viewer watches as the lead vehicle returns fire and kills the sniper and listens in while this information is passed to the patrol leader, who orders the patrol to continue its mission. The video continues highlighting key correct counter sniper actions.

## Appendix E

### Back Brief Method of Assessment

# Counter Sniper Actions



# Counter Sniper Actions

**Write your responses in the space provided based upon your understanding of the TTP presented. Once you have written down all of your responses, go back and record the proper sequence of the actions and orders by placing a number in front of it.**

**Execution:**

- A)** Back Brief your platoon leader on the five key actions in countering sniper fire. For example, begin by explaining what you should check first and how you should increase your Situational Awareness. Then describe how you should retrieve casualties during a sniper attack.

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- B)** When fired upon by a sniper, what actions should you take?

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- C)** Why is it important to reposition vehicles after a sniper attack?

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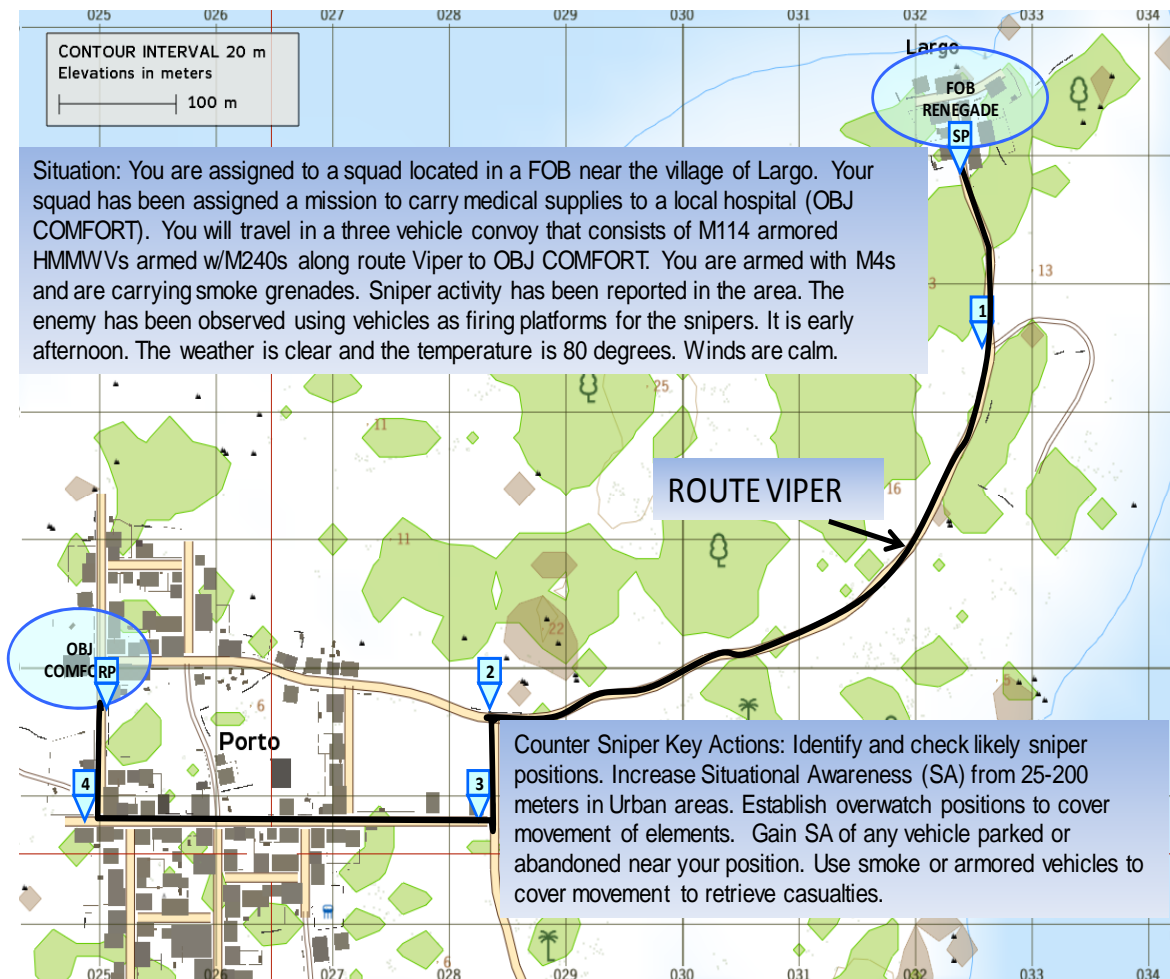
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## Appendix F

### Traditional Questions Method of Assessment

# Counter Sniper Actions



# Counter Sniper Actions

Please answer all questions based upon your understanding of the TTP presented.

- 1)** What actions should you take if you come under sniper fire? (Circle the best answer)
  - a) Immediately return fire from your current position.
  - b) Seek cover and concealment.
  - c) Attend to the wounded while using smoke as cover.
  - d) Change location and seek cover 90 degrees from the direction of the shot.
  
- 2)** You are the squad leader of 2<sup>nd</sup> squad, 1<sup>st</sup> platoon. You are conducting a mounted patrol in armored HMMWVs when you come across a civilian who appears to be wounded. What actions do you take? (Circle the best answer)
  - a) Dismount and render aid to the civilian.
  - b) If possible, use the HMMWVs as cover to approach the civilian and employ smoke to conceal your movement.
  - c) Report the civilian casualty to higher and request a MEDEVAC.
  - d) Employ smoke to conceal your movement to aid the civilian.
  
- 3)** You are the squad leader 2<sup>nd</sup> squad, 1<sup>st</sup> platoon conducting a mounted patrol along an MSR. Your patrol has stopped to investigate a suspected IED alongside the MSR. You notice that a civilian vehicle is approaching your location. As the vehicle nears, you realize that this is at least the second time the vehicle has driven by your location. What actions should you take? (Circle all that apply)
  - a) Increase Situational Awareness (SA) from 25 -200 meters.
  - b) Order your squad back in the vehicles and continue the patrol.
  - c) Order the vehicle drivers to reposition the vehicles before remounting to continue the patrol.

- d) Employ smoke to conceal your dismounts movement back to the vehicles.
- 4)** Part of your patrol has dismounted the vehicles to inspect a suspected IED location. As you approach the IED, you notice a car with a flat tire parked about 50 meters north of the IED location. There are no other cars near the one with a flat. What should the dismounts do? (Circle the best answer)
- a) Gain SA of the vehicle.
  - b) Increase SA to 200 meters.
  - c) Reposition the vehicles before the dismounts return.
  - d) Use a vehicle to provide cover for the dismounts as they return to the patrol.
  - e) Gain SA of the vehicle and increase overall SA to 200 meters.
  - f) Gain SA of the vehicle and increase overall SA to 200 meters.  
Reposition the vehicles before the dismounts return.
- 5)** Your patrol is moving along ROUTE VIPER en route to OBJ COMFORT. As you approach CP 2, you notice some civilian vehicles parked along the left side of the road. Refer to figure # 1 to determine what, if any, threat the vehicles may present. (Circle the best answer)
- a) No threat is present.
  - b) The last vehicle, with the two civilians near, is suspicious. It may present a baited situation.
  - c) The lead vehicle is suspicious as it presents a firing platform in the truck bed.
  - d) The middle vehicle is suspicious in the way it is oriented compared to the other two vehicles.





Figure 1: Aerial Photo of CP 2

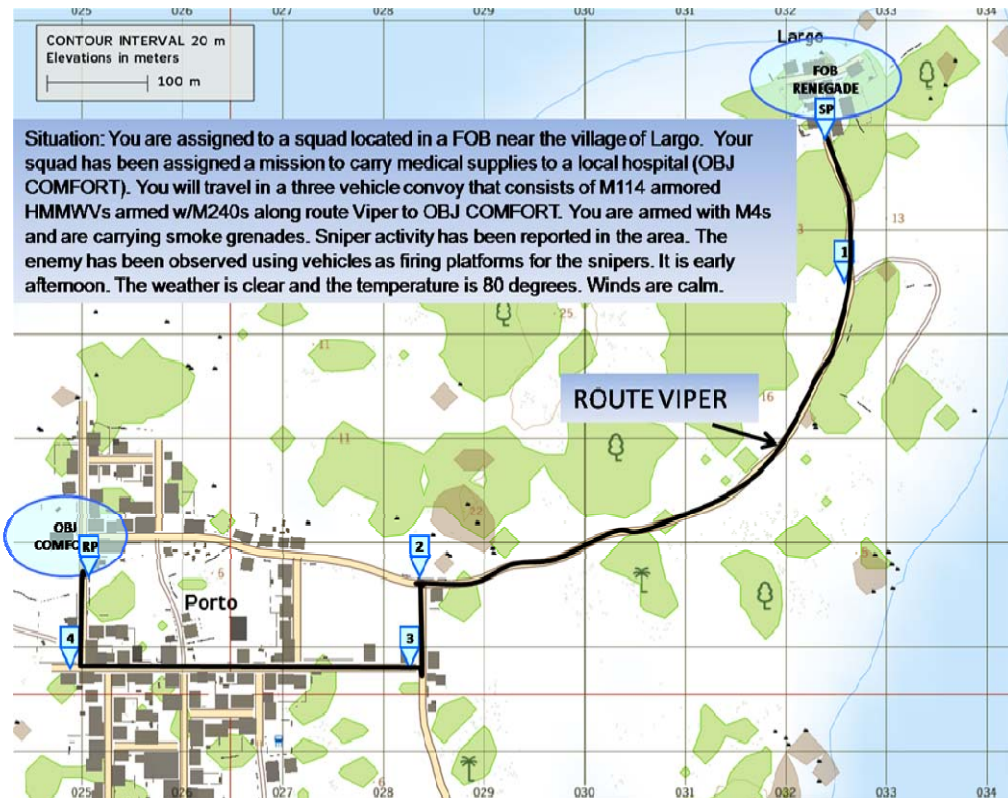
## APPENDIX G

### Video Method of Assessment

## Counter Sniper Actions

### Video (V+) Method of Assessment

### TTP – Counter Sniper – Incorrect Key Actions



**Video Overview.** The Counter Sniper Actions video was adapted from TTP posted on the Center For Army Lessons Learned website under Recommended Documents. The planning and execution of the video method was very similar to traditional methods in producing short films. The video was produced using actual role players executing each step of the TTP in the VBS2 simulation and recorded using the AAR function of the system. Each role player had a specific function and dialogue that was executed at the appropriate time. The dialogue was scripted to ensure each step of the TTP was accurately portrayed, and was recorded as radio traffic directly into the AAR file. The AAR file was then used to capture video and edited into its final form to accurately portray the TTP. The incorrect version portrayed correct TTP actions with incorrect actions embedded in the video. Viewers were then asked to identify these incorrect actions. A partial description of the video focused on two Key Actions: (1) Identify and check likely sniper positions; and, (2) Increase Situational Awareness (SA) from 25-200 meters in urban areas

**Incorrect Key Actions.** The Counter Sniper incorrect video opens with a patrol entering a village. The viewer listens in while the lead vehicle is engaged by a sniper located in the bed of a truck oriented on an avenue of approach near CP 2. The patrol failed to identify this vehicle as a potential sniper location resulting in one Soldier KIA. The patrol leader failed to order an increase of SA out to 200 meters. After evacuating the KIA the patrol continues its mission.

## Counter Sniper Actions

What went wrong in the mission that you just watched? (Circle the best answers)

- a) Did not establish an overwatch position when maneuvering to retrieve casualty.
- b) Identified likely sniper positions but failed to relay to the entire patrol.
- c) Failed to identify likely sniper positions in each location.
- d) Exposed personnel did not seek cover.
- e) Exposed personnel failed to move 90 degrees to the direction of the sniper attack.
- f) Failed to use smoke to conceal movement to retrieve casualty.
- g) Failed to use an armored vehicle as cover to move to pick up casualty.
- h) Used vehicle as cover but failed to use smoke.

Appendix H

Participant Feedback Questionnaire

**Instructions:** The questions below ask for your opinions about the TTP materials and tools you used today. Write-in comments, both positive and negative, are encouraged. Please use a separate sheet of paper if you need additional space.

**1. Please rank order the three modes of communicating TTP in terms of how good a job they did in conveying the TTP. (That is, place a 1) next to the best method, a 2) next to the second best method, and so on)**

- Written
- Written + Graphic
- Written + Graphic + Video

**Comments:**

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**2. What are your general impressions of the TTP communication methods (written, graphic, video) used today?**

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**3. Do you have any suggestions on how to improve TTP communication?**

**Written:**

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**Written + Graphic:**

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**Written + Graphic + Video:**

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**Please proceed to next page**

4. Please rank order the assessment measures used to measure a Soldier's understanding of TTP.

- Written back brief
- Traditional questions
- Video-situated questions (identification of errors)

Comments:

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5. What are your general impressions of the TTP assessment methods (back brief, traditional questions, video-situated questions) used today?

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6. Do you have any suggestions on how to improve the assessment of TTP understanding?

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7. In a typical unit, do you believe that the commander would employ the assessment methods to measure Soldiers' understanding of TTP? (Circle one answer for each)

- |   |     |    |          |
|---|-----|----|----------|
| a) Written back brief                                 | Yes | No | Not sure |
| b) Traditional questions                              | Yes | No | Not sure |
| c) Video-situated questions (using VBS2, for example) | Yes | No | Not sure |

8. How difficult were the different assessment methods? (Circle one answer for each)

- |                             |          |             |          |
|-----------------------------|----------|-------------|----------|
| a) Written back brief       | Too Easy | About Right | Too Hard |
| b) Traditional questions    | Too Easy | About Right | Too Hard |
| c) Video-situated questions | Too Easy | About Right | Too Hard |

9. How much do you agree or disagree that the <u>written TTP</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Portrayed the tactical environment with sufficient realism	1	2	3	4	5
b. Provided enough information to understand the tactical situation	1	2	3	4	5
c. Represented enemy elements and capabilities realistically	1	2	3	4	5
d. Enabled me to visualize the environment	1	2	3	4	5
e. Allowed me to visualize how to execute the TTP	1	2	3	4	5
f. Caused me to consider and decide between courses of action	1	2	3	4	5
g. Portrayed realistic enemy doctrine/tactics	1	2	3	4	5
h. Concretely demonstrated execution of the TTP	1	2	3	4	5
i. Effectively engaged me in thinking through the TTP	1	2	3	4	5
j. Was clearly communicated and easy to understand	1	2	3	4	5
<b>Comments and Suggestions:</b>					

10. How much do you agree or disagree that the <u>written + graphics TTP</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Portrayed the tactical environment with sufficient realism	1	2	3	4	5
b. Provided enough information to understand the tactical situation	1	2	3	4	5
c. Represented enemy elements and capabilities realistically	1	2	3	4	5
d. Enabled me to visualize the environment	1	2	3	4	5
e. Allowed me to visualize how to execute the TTP	1	2	3	4	5
f. Caused me to consider and decide between courses of action	1	2	3	4	5
g. Portrayed realistic enemy doctrine/tactics	1	2	3	4	5
h. Concretely demonstrated execution of the TTP	1	2	3	4	5
i. Effectively engaged me in thinking through the TTP	1	2	3	4	5
j. Was clearly communicated and easy to understand	1	2	3	4	5
<b>Comments and Suggestions:</b>					

Please proceed to next page

11. How much do you agree or disagree that the <u>written + graphics + video TTP</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Portrayed the tactical environment with sufficient realism	1	2	3	4	5
b. Provided enough information to understand the tactical situation	1	2	3	4	5
c. Represented enemy elements and capabilities realistically	1	2	3	4	5
d. Enabled me to visualize the environment	1	2	3	4	5
e. Allowed me to visualize how to execute the TTP	1	2	3	4	5
f. Caused me to consider and decide between courses of action	1	2	3	4	5
g. Portrayed realistic enemy doctrine/tactics	1	2	3	4	5
h. Concretely demonstrated execution of the TTP	1	2	3	4	5
i. Effectively engaged me in thinking through the TTP	1	2	3	4	5
j. Was clearly communicated and easy to understand	1	2	3	4	5
<b>Comments and Suggestions:</b>					

12. How much do you agree or disagree that the <u>assessment methods</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Tested the important aspects of TTP?	1	2	3	4	5
b. Asked me to do too much in the time I had available?	1	2	3	4	5
c. Allocated the right amount of time for the various activities?	1	2	3	4	5
<b>Comments and Suggestions:</b>					

13. How much do you agree or disagree that the <u>materials</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Provided adequate information to understand your role	1	2	3	4	5
b. Effectively explained your duties	1	2	3	4	5
c. Detailed the steps required to achieve your duties	1	2	3	4	5
d. Were clearly presented and easy to understand	1	2	3	4	5
e. Provided enough background	1	2	3	4	5
f. Adequately defined and explained unfamiliar terms	1	2	3	4	5
<b>Comments and Suggestions:</b>					

Please proceed to next page

14. How much do you agree or disagree that the <u>orientation</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Set the stage well for the session	1	2	3	4	5
b. Provided everything I needed to know about the experiment	1	2	3	4	5
c. Contained accurate information about TTP	1	2	3	4	5
d. Adequately addressed all of your concerns/questions	1	2	3	4	5
e. Was clearly presented and easy to understand	1	2	3	4	5
<b>Comments and Suggestions:</b>					

15. How much do you agree or disagree that the <u>procedures</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Facilitated solid understanding of TTP	1	2	3	4	5
b. Encouraged me to explore all aspects of the TTP	1	2	3	4	5
d. Enabled me to work effectively with the right focus	1	2	3	4	5
<b>Comments and Suggestions:</b>					

16. How much do you agree or disagree that the <u>schedule</u> :	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Took too long for the activities we completed?	1	2	3	4	5
b. Asked me to do too much in the time I had available?	1	2	3	4	5
c. Allocated the right amount of time for the various activities?	1	2	3	4	5
d. Enabled me to spend my time efficiently?	1	2	3	4	5
e. Organized my activities in the right sequence?	1	2	3	4	5
f. Gave me enough break time when I needed it?	1	2	3	4	5
<b>Comments and Suggestions:</b>					

**Thank you for your feedback!**



Appendix I

Experimenter Log

**EXPERIMENTER'S EVENT LOG – SU-TTP Project**

Location: Gordon Hood Knox

Condition: Control Experimental

Date \_\_\_\_\_

Session: AM PM

Event	# Partic's	Start Time	End Time	TTP	Method	Notes / Problems / Changes
<b>Orientation</b>						
<b>TEST #1</b>						
TTP Study				BC / TCP / CS	W+ / G+ / V+	
Assmt #1a					Back Brief	
Assmt #1b					Direct Query	
Assmt #1c					Video-Situated Query	
<b>TEST #2</b>						
TTP Study				BC / TCP / CS	W+ / G+ / V+	
Assmt #2a					Back Brief	
Assmt #2b					Direct Query	
Assmt #2c					Video-Situated Query	
<b>TEST #3</b>						
TTP Study				BC / TCP / CS	W+ / G+ / V+	
Assmt #3a					Back Brief	
Assmt #3b					Direct Query	
Assmt #3c					Video-Situated Query	
<b>Questionnaire</b>						
<b>Hotwash</b>						

Appendix J  
Participant Profile Questionnaire

Name: \_\_\_\_\_ Rank: \_\_\_\_\_ Branch/MOS: \_\_\_\_\_

Time in Service: \_\_\_\_\_ yrs \_\_\_\_\_ mos Unit: \_\_\_\_\_

Installation Where Assigned (circle one): Ft. Gordon Ft. Hood Ft. Knox

**1. Military Education** (Check all that apply)

Enlisted / NCO	
BCT	
AIT/OSUT	
ALC/BNCOG	
SLC/ANCOG	
Other _____	

Officer	
BOLC III/OBC	
CPTs Career Course/OAC	
CAS3	
ILE	
Other _____	

**2. Military Experience** (Check all that apply)

Enlisted / NCO	
Vehicle Commander	
Fire Team Leader	
Squad Leader	
Platoon Sergeant	

Officer	
Platoon Leader	
Company XO/LNO	
Company CDR	
Battalion S3/XO	

**3. Assignment History** (List last three positions held, beginning with the most current one)

Position	Unit	Time (mos)
1.		
2.		
3.		

**4. Deployment Experience** (Provide information for all that apply)

	Position(s)	Unit(s)	Time (mos)
<b>OIF</b>			
<b>OEF</b>			
<b>Bosnia</b>			
<b>Other</b>			

**5. Do you have experience developing unit SOPs or TTPs? (Circle one and explain.)**

3-Much Experience      2-Some Experience      1-Little Experience      0-None

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**6. Do you have experience presenting back briefs or confirmation briefs? (Circle one and explain.)**

3-Much Experience      2-Some Experience      1-Little Experience      0-None

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<b>7. How much do you agree or disagree that <u>you</u>:</b>	Circle One for Each Item				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. Are familiar with counter sniper actions?	1	2	3	4	5
b. Have executed counter sniper actions in training?	1	2	3	4	5
c. Have executed counter sniper actions in combat?	1	2	3	4	5
d. Are familiar with break contact procedures?	1	2	3	4	5
e. Have executed break contact procedures in training?	1	2	3	4	5
f. Have executed break contact procedures in combat?	1	2	3	4	5
g. Are familiar with traffic control point procedures?	1	2	3	4	5
h. Have executed traffic control point procedures in training?	1	2	3	4	5
i. Have executed traffic control point procedures in combat?	1	2	3	4	5
<b>Comments and Clarifications:</b>					